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Gain in New Orders Continues

Current Mill and Furnace Bookings Still on the Rise and Specifications Generally Are Stimulated as Buyers Acquire Stronger Faith—July Pig Iron Production Shows Only Slight Decline—Outlook for Railroad Buying Good

AUGUST business in iron and steel has been keeping ahead of July which in turn was better than June. This is the foundation for the stronger tone now working through the market and for the improving prospects for mill operations for the remaining period of the year. Some independent companies put their recent gain in orders at 10 per cent which is equivalent to about 80 per cent of capacity. Other companies enjoying especially favorable conditions recently have been booking as much tonnage as they have been shipping. Their deliveries consequently still are far deferred. Steel deliveries in general show only moderate improvement as buyers by their insistence for tonnage are keeping unfilled orders on mill books in a highly liquid state.

Mill specifications generally have been stimulated lately. The leading sheet and tin plate maker is carrying over a large tonnage into the fourth quarter and is delaying its announcement of prices for that period, the adjustments incident to the elimination of the 12-hour day being an important factor. Independent sheet mills are not in so favorable a position and operations in the Mahoning valley this week are at 66 per cent, the smallest in over a year. Black sheets continue to be sold by some of the smaller mills at concessions. This softness together with shading in reinforcing bars and strip steel constitute the only notable irregularities in prices.

Slight changes in IRON TRADE REVIEW composite of fourteen leading iron and steel products still is the rule with pig iron the variable. The average this week is $44.88 against $44.97 last week.

Iron Output Still High

Complete figures bear out the early indications that July pig iron production was unexpectedly well maintained. The daily average was 118,859 tons or less than 3 per cent down from June. Total output in July due to the one day longer period actually was greater than June or in the comparison of 3,684,631 tons to 3,667,868 tons and was the largest of any single month on record excepting May with 3,868,486 tons. During July 26 furnaces were blown out and banked and 3 went in, a net loss of 23 of which 15 were steelworks and 8 were merchant stacks. The active list July 31 numbered 299 against 322 June 30. Production of ferromanganese in July was the heaviest since December 1920.

Good Outlook for Roads

Outlook for railroad buying in the fall is reported to be promising. At present the roads continue to press the mills for the steel on order and to place a considerable amount of new business in a miscellaneous way though equipment orders remain few. Car orders in July totaled only 1450. A number of the roads continue to inquire for 1924 rails, some of the latest lots of this kind being 50,000 tons for the Norfolk & Western and 10,000 tons for a western road but the mills refrain from naming prices.

Buying of pig iron has kept up in increased volume the past week. Large buyers are watching the market closely and some of them are receptive purchasers as far ahead as July 1924. In eastern Pennsylvania sales of basic involve 30,000 to 40,000 tons at slightly lower prices. Resale valley basic has gone this week at $24 but a subsequent sale by a producer was at $25. A Westfield, Mass., interest is credited with purchases of 6000 to 10,000 tons of foundry iron. Less tendency to shade prices is shown but southern iron is offered lower at $23.50, Birmingham. Pig iron stocks in Alabama increased 35,000 tons in July.

Export Trade Is Better

An eastern Pennsylvania pipe foundry has purchased 6000 tons of British foundry pig iron at $22.85 shipping port or about $26 delivered. Export demand upon the American mills is better than for sometime especially from the Far East. The 19,000 boxes of tin plate for the Nippon Oil Co. has gone to British producers. The iron and steel industry in the Ruhr now is at a practical standstill as France pursues vigorously her policy against Germany. Only 11 blast furnaces with a daily output of about 2000 tons now are operating in the Ruhr.

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Better Iron Buying Keeps Up

Enlarged Volume of New Sales Made in All Territories—Negotiations by Some Large Consumers Being Carried On—Prices Not Yet Fully Stabilized but Are Steadier—Alabama Iron Quoted at $23.50

PITTSBURG, Aug. 7.—Intermittent issuing of fairly large inquiries and occasional tonnage sales of pig iron interrupt the tedium of small lot buying which for weeks has confronted the trade in this district. A Sharon, Pa., interest last week closed on at least 2000 tons of basic at $24, valley. The business is reported to have gone to a middleman. The producers generally have been asking $25 valley and it is doubted if the $25 price now can be duplicated. Since then a fair tonnage was sold by a furnace at $25 valley. While four or five furnace interests are in a position where they do not have to force the disposal of their piled iron, some of the holders of approximately 300,000 tons in this district are less fortunately situated. The Edgewater Steel Co. has been negotiating for 2000 tons of basic. The McConway & Torley Co. purchased 600 tons of bessemer through a broker at $26, valley. Some producers quoted $26.50, valley, thereby losing this business. One Pittsburgh consumer of bessemer iron recently closed on 600 tons of broken bessemer castings at $24.50, valley. Since the sale of bessemer at $26 several others have been consummated involving a total of 750 tons including one 500-ton lot all at $26.50, valley. Malleable is unchanged except that the spread is wider since one or two producers will not go below $26.50. From $25 to $26.50, valley, is quoted. One middle interest has out an inquiry for 500 tons, two or three users have issued inquiries for 200 to 300 tons, including one from Cleveland and the Warren Tool & Forge Co., Warren, O., is inquiring for 1000 tons for the remainder of the year. In foundry iron, the National Radiator Co., Johnstown, Pa., closed on 1500 tons at an understood figure of $26, delivered. One or two middle interests as well as at least one valley producer continue to quote $25, valley, on the No. 2 grade. The majority of producers, however, will not go below $26, valley. Tonnage inquiries are lacking in foundry. One producer continues to quote $25, f.o.b. Dunbar, Pa., while the Bethlehem Steel Co. is booking small lots, 50 to 400 tons at a time, at $26, f.o.b. Johnstown.

Some Concessions Made

Boston, Aug. 7.—While it is understood that concessions have been made on iron for prompt shipment somewhat under recent levels, details of these transactions are not available. Reluctance to quote for fourth quarter is general. Where eastern Pennsylvania iron is offered at $25, base, or $28.65 delivered New England, dealers quote $25.50 base or $29.15 delivered for fourth quarter. Buffalo iron is also offered at 50 cents above prevailing prices for fourth quarter, but instances are related where orders have been booked at $25 base, or $29.91 delivered. At least 5200 tons of iron has been sold in New England in the past week, and it is rumored that much more has been sold. Details of the American Hardware Corp. sale of 1000 tons of No. 1X iron are withheld, but it was for prompt shipment from an eastern Pennsylvania furnace. Some 800 tons of eastern Pennsylvania iron has been sold at $26 base and between 1500 and 2500 tons of iron in small lots for prompt shipment has been done at $25 base for third quarter shipment. About 1000 tons of Buffalo iron has been sold in odd lots at $25 base. Some No. 2X Buffalo iron has been sold at $25 with $25.50 to $26 for No. 1X. It is understood a large pipe foundry has bought 1250 tons of high silicon Virginia iron for less than $27, and it is rumored that 6000 tons of No. 2 plain, eastern Pennsylvania, has been done at $24, but neither can be verified. Some Scotch iron has figured in the sales this week. Charcoal iron has been sold in carlots at $29 base, or $37.20 delivered. A Massachusetts heater company is inquiring for 3000 tons of 1.75 to 2.25 silicon iron.

Some Round Sales Made

New York, Aug. 7.—Business in pig iron continues good here. Sales in the general New York territory during the past week agregated 20,000 to 25,000 tons. New inquiry is not coming out as rapidly as during the past two or three weeks. Formal inquiries now pending do not exceed a few thousand tons. However, a number of large blocks are in sight which may come out shortly. A good deal of tonnage remains to be closed. The Worthington Pump & Machinery Corp. bought more than 3000 tons. The General Electric Co. bought 2000 tons for Schenectady, the Crane Co., Bridgeport, 2500 tons, the Wm. M. Crane Co., Jersey City, about 1000 tons, the Richardson & Boynton Co., Dover, N. J., at least 3000 tons and the A. P. Smith Mfg. Co., 300 tons. Included in the week's business were a number of other lots involving each 500 tons or less. It is understood that the H. B. Smith Co., Westfield, Mass., bought from 6000 to 10,000 tons. The National Radiator Co. placed 1000 tons of foundry iron for its Trenton plant. An export sale involved 600 to 700 tons of foundry. Production is being curtailed in the Buffalo district; one Wickwire-Spencer and one Buffalo Union stack has been banked. No curtailment in production has developed in the East. Generally production seems to continue in excess of consumption. Prices are unchanged. On eastern foundry materially less than $24.50 furnace was done on attractive business during the past week. In general, the market on eastern foundry continues $24.50 to $25, furnace, without much attention being paid to silicon differentials. On Buffalo foundry most makers are quoting $25, furnace without much attention to silicons, but in some instances, Buffalo foundry sold as low as $24.50, furnace, during the past week. Central Pennsylvania foundry can be had as low as $24 to $25, base furnace. Eastern Pennsylvania malleable may be quoted at $25 to $26, furnace.

Buffalo Prices Steadier

Buffalo, Aug. 7.—The market appears stationary at $25 for foundry iron but some basic has sold for $24 and $24.50. On foundry of 2.25 to 2.75 silicon and 2.75 to 3.25 silicon, a $25.50 price has been obtained. One sale of 3.94 silicon brought $27.50. Selling during the week has been about 15,000 tons of which one interest has taken 10,000 tons. New inquiry has totaled 15,000 to 20,000 tons. The C Buffalo-Union stack has gone out and one of the Wickwire furnaces has been banked.

Demand Much More Active

Cincinnati, Aug. 7.—Demand for pig iron is more active and inquiries are coming in not only from territory that has purchased here in the past but from new directions. Price shading is not as general, although a leading seller during the past week circularized the trade with a $25.50, Ironton base quotation on northern iron and as a result obtained orders aggregating more than 2000 tons. On Monday the seller returned to the $26, base quotation. The southern Ohio market is gaining strength. It is quotable at $26 to $27, base. The producer asking $27 was quoting $28, a week ago. The southern market ranges from $23.50 to $27, Birmingham base, although the latter quotation is not a factor as to sales. A fair sized tonnage of southern resale iron went to northern Ohio at $23.50 base.

Inquiry for northern iron shows marked improvement. A survey of local foundries discloses the majority is assured of steady operation over the remainder of the year, in the event there is no cancellation of orders. By the end of this week, there will be only two merchant furnaces in operation in the southern Ohio district. The Belfont Iron Works stack will go out of blast, leaving the field to the Hanging Rock Furnace Co., and the Marting Iron & Steel Co.

A Columbus, O., melter took 1200 tons of northern foundry, the Muncie Malleable Co., at Muncie, Ind., 500 tons of malleable, at a price said to be below $26, Ironton base; a Hamilton, O., consumer, 600 tons of northern foundry iron and 700 tons of southern; the International Harvester Co., 300 tons of malleable for Springfield, and an In-

diana melter, 200 tons of malleable. The Seybold Machine Co., Dayton, O., closed for 500 tons of northern foundry iron. Sales of 600 tons of bessemer iron to the McConway-Torley Co., Pittsburgh, also is noted. A leading seller reports 500 tons of northern and 500 tons of charcoal iron sold to a Michigan melter.

Inquiries range from a carload to 100 tons. The Interstate Car Company, Indianapolis, is inquiring for 400 tons of northern. An inquiry for 700 tons of silvery and southern iron has been received from a Michigan stove manufacturer.

Large Buyers Negotiating

Cleveland, Aug. 7.—A number of large users of pig iron have begun negotiations for important tonnages, in some instances the amounts indicated running as high as 10,000 tons or more a month, and for delivery as far ahead as the first half of 1924. The outstanding feature of the market this week is the fact that these buyers are showing more confidence, and seek to take advantage of present low prices over a long period. Some fairly good sales have been closed for fourth quarter at present levels, and in other instances reservations have been made for that period at prices to be quoted by IRON TRADE REVIEW and other trade journals. While reports are current that $24 valley has been done on No. 2 foundry iron, there is nothing definite to substantiate such a price at this time. In some instances offers of $25, valley, failed to get business that was offered in competition. On the other hand, sales at $25, valley, have been made, involving good size tonnages. Cleveland furnace interests have been doing business on this basis. A large valley interest continues to quote $26. The market for basic also has been clarified by the sale of a good tonnage at $25, valley, by one of the interests represented in the northern Ohio group. A maker with headquarters in Cleveland closed in July for 40,000 tons of pig iron at an average price of $25.50. Another booked around 50,000 tons in July. In the past week a lake furnace interest booked 6000 tons, and another 10,000 tons, these sales including fourth quarter deliveries. The General Electric Co., closed for moderate tonnages for its Erie and other eastern plants; the Westinghouse Electric & Mfg. Co., took some for its Trafford City, Pa., works; the National Malleable Castings Co., closed for around 1000 tons of malleable for Indianapolis. A lake furnace is quoting $26.50 to $27, base, while Cleveland makers are naming a valley basis of $25 for outside territory, and $26, furnace, for delivery in Cleveland. The Cleveland delivered price is $26.50. Cincinnati machine tool builders have been buying. The Ferro Foundry & Machine Co. Cleveland, is reported in the market again; a Mansfield, O., foundry is in for 200 tons of foundry iron; a central Ohio foundry is seeking 1000 tons of malleable for last half and another central Ohio user, 500 tons of foundry iron. A western Ohio consumer that inquired last week of 500 tons of basic, closed for 100 tons of resale iron. The usual run of formal inquiry amounts to around 6000 tons.

More Sales at Chicago

Chicago, Aug. 7.—Pig iron buying is much improved. Actual sales in this

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Coke Prices Are Firmer

Curtailment of Production Brings Reaction to $4.50 for Furnace Grade—Foundries Again Specifying—72-Hour Fuel Unchanged

COKE PRICES, PAGE 355

Pittsburgh, Aug. 7.—Disappearance of the $4 price on beehive coke insofar as the standard furnace grade is concerned has been brought about by curtailment of production. Additional ovens have been blown out and those operators still making coke are naming figures around $4.50. Only a limited tonnage was sold at the $4 level. The coke had to be moved to grant the railroad request for cars. Now the standard 48-hour fuel market cannot be quoted below $4.25 to $4.50, and in some directions before the week is out a $4.75 maximum undoubtedly will be introduced. At the moment a certain group of producers will not go below $4.50, ovens. The Wheeling Steel Corp.'s order for 10,000 tons for August shipment, referred to last week, was closed at a trifle below $4.50. A local steel interest to help out its by-product coke supply has closed on 200 carloads at around that same figure. Yesterday blast furnace coke was offered here at a minimum of $4.25. A fair demand still exists for medium or high sulphur coke for non-metallurgical or smelter purposes. Numerous small lots are before the trade while a few inquiries are current for 1000 to 2000 tons. Demand for foundry coke still is somewhat limited although greater than a few weeks ago. At that time, some suspensions were received and now the foundries have caught up and are specifying. Some of the contracts for standard selected 72-hour fuel taken at $7.50 have been readjusted to a $7 base. One other brand is selling in lots of 50 to 500 tons at a time, the larger tonnages over a period of months, some for the remainder of the year, at $7. The regular market however, is unchanged at $5 to $5.75. Production, according to the *Connellsville Courier* for the week ended July 28 was 272,910 tons as compared with 276,540 tons the preceding week.

Better Inquiry for Foundry Coke

Boston, Aug. 7.—Providence Gas Co. is quoting $3.50 for foundry coke for August and the New England Coal & Coke Co. is maintaining that price. Requisitions for coke are larger than in a long time. Domestic sizes are hard to get and possibly may have some bearing on the better inquiry for foundry coke.

Prices Are Unsteady

Cincinnati, Aug. 7.—The market for foundry coke is somewhat erratic, asking prices in some cases being higher, while in others they are lower than a week ago. Sellers are asking on an average of 25 cents a ton more for high sulphur Connellsville foundry and furnace coke, which is attributed to curtailment in production and increased demand from smelters. Generally inquiry for coke is less active, but sufficient remains to prevent the market from easing off further. During the week some distress Connellsville furnace coke was offered here at $4.80 ovens. The bulk of the sales involve carlots, although a leading seller reports the sale of 25 cars of by-product coke to an Indiana user for shipment in the next two weeks. A sale of 200 tons of Connellsville foundry coke to a local user also is noted. A few inquiries are out for one to three cars of Wise county foundry coke a week for the next two months. By-product interests continue to operate at capacity and report old orders are taking care of their current output.

Eastern Market Steady

New York, Aug. 7.—Demand for foundry coke is still slow, but the market is kept fairly steady by the demand from coal dealers who are laying in coke in anticipation of a coal shortage, for domestic heating purposes. Standard foundry coke for spot shipment averages $5.50 to $6, Connellsville, although as high as $7 continues to be obtained on special brands. The Seaboard By-Products Coke Co. continues to obtain $11.34 to $11.41, delivered at Newark and other northern New Jersey points, for its by-product foundry coke.

Market Is Dull at St. Louis

St. Louis, Aug. 6.—Inquiry and sales in the coke market continue at a low ebb. Connellsville offerings are liberal, prices ranging from $5.75 to $7 on foundry grades. Quotations of by-product ovens remain unchanged, but all plants report rapidly increasing accumulations, particularly of domestic sizes. Shipments to industrial consumers are on a large scale, but represent old business. A fair volume of car lot buying by users in the lead and zinc field is reported. There is no change from dull conditions in the soft coal situation. Mines in the adjacent Illinois field are operating on an average of one-fourth time.

Slight Improvement in South

Birmingham, Ala., Aug. 6.—A slight improvement is noted in the coke market in the South, some new orders being received, though the total is not very large. Quotations are weak, foundry coke being priced around $8 per ton. There has been no change in the rate of production in this state. The shutting down of sanitary pipe shops affected the market, but there was improvement in demand from other directions. Independent coke producers are encouraged over a better feeling in the market, and hope is expressed that some sales can be consummated that will cover the probable make during the last three months of the year.

The Wolverine Brass Co., Grand Rapids, Mich., has called for redemption the remaining $84,000 6 per cent bonds issued in 1915, in preparation to a new first mortgage bond issue of $250,000. The new issue is to finance a large addition to the plant and to refund what is left of the old loan. The new plant expansion will begin about Jan. 1, say officials.

Iron Buying Keeps Up

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district are almost double those of the previous week. Inquiry is urgent and well diversified. A large tonnage has been placed for the last quarter. A Wisconsin melter is inquiring for 750 tons of malleable; a Chicago foundry for 1000 tons of malleable; and another Chicago user for 1000 tons of foundry iron for the balance of the year. An Illinois consumer is asking for 500 tons of low phosphorus iron. Sales include three 2000-ton lots; one 3000-ton lot and many of 500 and 300 tons. Silveries and lake charcoal iron prices are unchanged, but firm. Resale ferrosilicon is down $1.

Sales Still Are Slow

Birmingham, Ala., Aug. 6.—Even at $24, for No. 2 foundry, no big business has been stimulated in the southern pig iron market. One of the smaller interests is accepting the $24 price on a little tonnage for delivery during the early part of the fourth quarter. The $27 price still is being quoted by some. A company with two furnaces which has not cut below $27, says it has not taken any new business recently, except an occasional carload. Companies reported selling at $27 include the Alabama Co., Woodward Iron Co., Sloss-Sheffield Steel & Iron Co., and the Republic Iron & Steel Co.

The Central Coal & Iron Co., of the Iron Producers Corp. is reported to be on a $24 to $25 basis with one furnace in blast. Surplus stocks of pig iron are increasing.

Big Basic Sale in East

Philadelphia, Aug. 7.—The heaviest pig iron buying here in several months is in progress. The leading purchase involves 30,000 to 40,000 tons of basic for one of the eastern steelmakers, at prices which fix the market at $25 to $25.25, delivered. Additional basic business comprises 2000 tons, and several thousand tons more now are under negotiation. The large purchase alluded to is for September and October shipment, a large business in foundry iron is being done. This probably involves fully 25,000 tons, mostly in 500-ton lots and smaller. The trade is considerably cheered by this activity and by indications that further large buying will develop. Hence there is less tendency to shade prices. Eastern prices now generally are firm at $25, base furnace, plus 50-cent silicon differentials for foundry iron. There is much activity in low phosphorus iron. Inquiry now is pending for 1000 tons. The market continues quotable at $32 to $33, furnace for copper-bearing and $32.79, delivered at Philadelphia, for copper-free iron. Generally producers refuse to sell for the fourth quarter alone believing prices will be higher due to uncertainty as to whether there will be a coal strike. The Brooke furnace at Birdsboro, Pa., will blow out the latter part of this month. The Bethlehem Steel Co. has banked one Coatesville furnace.

Steelmakers in the Market

St. Louis, Aug. 6.—Actual sales and inquiry in pig iron during the past 10 days have been considerably larger than during the past several months. An inquiry is out for 5000 tons of basic, from a local interest for third quarter, and 3000 tons of off-basic for prompt shipment was sold by the leading local producer to an East Side user. This same maker reports the sale of 500 tons of foundry iron for spot delivery, with 500 additional tons pending; also 250 tons of the same grade to a nearby melter and 300 tons in scattered carlots. Other agencies report scattering sales totaling about 1200 tons. An inquiry is pending for 1000 tons of malleable from an Indiana melter, for fourth quarter. A local interest is asking for 200 to 400 tons of malleable, and a leading machinery plant which recently took 100 tons of high silicon, is inquiring for 200 tons of 8 to 9 per cent.

Southern iron is offered as low as $24 furnace, though several of the leading Birmingham makers refuse to shade $26 and $27. No northern can be had as low as $26 Chicago, a small transaction on that basis having been reported last week. The leading local producer has lowered its quotation to $27.50 to $28.50, f.o.b. Granite City.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Aug. 8, 1923	July 1923	May 1923	August 1922
PIG IRON				
Bessemer, valley del. Pitts....	$27.77	28.52	32.07	29.16
Basic, valley	25.00	25.15	29.80	27.96
Basic, eastern del., eastern Pa...	25.10	27.25	30.75	29.50
*No. 2 foundry, del. Pitts.....	26.77	27.37	31.91	32.76
*No. 2 foundry, Chicago.....	27.00	28.00	32.50	28.60
*Southern No. 2, Birmingham..	23.50	25.00	27.00	20.70
*Southern Ohio, No. 2, Ironton..	26.00	26.50	31.00	27.00
**No. 2X, Virginia furnace ...	26.50	27.25	28.60	26.00
***No. 2X, Eastern del., Phila	26.26	28.00	32.76	32.15
Malleable, valley	25.00	25.50	30.20	28.60
Malleable, Chicago	27.00	28.00	32.50	28.60
Lake Superior charcoal, Chicago	32.15	36.65	36.65	33.75
Gray forge, val. del. Pittsburgh	26.27	27.02	31.17	30.16
Ferromanganese, del. Pitts....	122.29	122.79	129.79	72.29
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	42.50	42.50	45.40	35.00
Sheet bars, open-hearth, Pitts....	42.50	42.50	45.40	35.00
Billets, bessemer, Pittsburgh....	42.50	42.50	45.00	35.00
Billets, open-hearth, Pittsburgh..	42.50	42.50	45.00	35.00
FINISHED MATERIAL				
Steel bars, Pittsburgh.....	2.40	2.40	2.40	1.80
Steel bars, Chicago	2.50	2.50	2.50	1.88
Steel bars, Philadelphia.....	2.72	2.72	2.77	2.275

	Aug. 8, 1923	July 1923	May 1923	August 1922
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia	$2.72	2.72	2.82	2.125
Iron bars, Chicago mills	2.50	2.55	2.60	1.98
Beams, Pittsburgh	2.50	2.50	2.50	1.80
Beams, Philadelphia	2.82	2.82	2.87	2.325
Beams, Chicago	2.60	2.60	2.60	1.90
Tank plates, Pittsburgh	2.50	2.50	2.50	1.80
Tank plates, Philadelphia	2.82	2.82	2.92	2.325
Tank plates, Chicago	2.60	2.60	2.60	1.90
Sheets, blk., No. 28, Pittsburgh.	3.85	3.85	3.85	3.25
Sheets, blue anl., No. 10, Pitts.	3.00	3.00	3.00	2.45
Sheets, galv., No. 28, Pittsburgh	5.00	5.00	5.00	4.25
Wire nails, Pittsburgh	3.00	3.00	3.00	2.40
COKE				
Connellsville furnace, ovens.....	4.25	4.35	5.10	13.20
Connellsville furnace, ovens....	5.00	5.15	6.10	14.30
OLD MATERIAL				
Heavy melting steel, Pittsburgh.	17.00	18.25	22.20	17.10
Heavy melting steel, eastern Pa..	16.00	17.25	20.40	15.25
Heavy melting steel, Chicago...	16.25	17.12	19.75	15.80
No. 1 wrought, eastern Pa....	17.50	18.85	24.40	18.25
No. 1 wrought, Chicago.....	16.25	16.62	19.95	16.35
Rails for rolling, Chicago.....	17.75	18.37	21.80	16.75

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago

August 8, 1923	August 1, 1923	July, 1923	May, 1923	August, 1922	August, 1913
$44.88	$44.97	$45.39	$47.52	$39.79	$25.97

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Iron and Steel Prices

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Pig Iron

Bessemer, valley	$26.00 to 26.50
Bessemer, Pittsburgh	27.77 to 28.27
Basic, valley	24.00 to 25.00
Basic, Pittsburgh	25.77 to 26.77
Basic, Buffalo	24.00 to 24.50
Basic, del. eastern Pa.	25.00 to 25.25
Malleable, valley	25.00 to 26.50
Malleable, Pittsburgh	26.77 to 28.27
Malleable, Chicago	27.00 to 27.50
Malleable, Buffalo	25.00
Malleable, del., eastern Pa.	26.25 to 26.75

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.23
No. 2 Southern foundry.	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	26.76
No. 1X, Buffalo	26.50
No. 2 foundry, valley	25.00 to 26.00
No. 2 foundry, Pittsburgh	26.77 to 27.77
No. 2 foundry, Buffalo	25.00
No. 2 foundry, Chicago	27.00 to 27.50
No. 2 foundry, Granite City	27.50 to 28.00
No. 2, foundry, Ironton fur.	26.00 to 27.00
No. 2 foundry, Cleveland del.	26.50 to 27.50
No. 2, foundry del. Phila.	25.76
No. 2 foundry, N. J. tidewater	26.13 to 26.76
No. 2X, eastern del., Phila.	26.26
No. 2X, east. N. J. tidewater	26.63 to 27.26
No. 2X, eastern del. Boston.	29.15 to 29.65
No. 2X foundry, Buffalo, fur.	25.50
No. 2X, Buffalo, del. Boston	29.91 to 30.41
No. 2 southern, Birmingham	23.50 to 24.00
No. 2 southern, Cincinnati	27.55 to 28.05
No. 2 southern, Chicago	29.51 to 30.01
No. 2 southern, Philadelphia	30.30 to 30.80
No. 2 southern, Cleveland	29.51 to 30.01
No. 2 southern, Boston (rail and water)	30.41 to 30.91
No. 2 southern, St. Louis	28.67 to 29.17
No. 2X, Virginia furnace	26.50 to 27.50
No. 2X, Virginia, Phila.	31.77 to 32.77
No. 2X, Virginia, Jersey City	32.04 to 33.04
No. 2X, Virginia, Boston	32.42 to 33.42
Gray forge, eastern Pa.	25.00 to 25.25
Gray forge, val. del., Pitts.	26.27
Low phos., standard, valley	34.00
Low phos., standard, Phila.	32.79
Low phos., Lebanon furnace	32.00 to 33.00
Charcoal, Birmingham	34.00
Charcoal, Superior, Chicago.	32.15

Silvery Iron

Jackson County, Ohio, furnace

7 to 8 per cent.	$33.00
8 to 9 per cent.	34.50
9 to 10 per cent.	36.50
10 to 11 per cent.	38.50
11 to 12 per cent.	41.00
12 per cent	43.50

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 to 11 per cent.	$43.50
11 to 12 per cent.	46.00
12 to 13 per cent.	48.50

Ferroalloys

†Ferromanganese 78 to 82 per cent, tidewater, or furnace	117.50
Ferromanganese, delivered, Pittsburgh	122.29
Spiegeleisen 19 to 21 per cent furnace or tidewater	45.00 to 47.50
Ferrosilicon, 50 per cent contract freight allowed	$82.50 to $87.50
Ferrotungsten standard, per pound contained	95.00
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon per pound contained, delivered	12.00
Imported ferrochrome, 4 to 6 per cent carbon	nominal

†Duty paid.

Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.50
Ferro carbon-titanium, carloads, producer's plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$4.25 to 4.75
Connellsville foundry	5.00 to 5.75
New River furnace	8.00 to 9.00
New River foundry	11.50 to 13.00
Wise county furnace	6.00 to 6.75
Wise county foundry	7.00 to 7.50
Alabama furnace	7.00 to 7.50
Alabama foundry	7.50 to 8.00

By-Product

Foundry, Newark, N. J., del.	$11.34 to 11.41
Foundry, Chicago, ovens	13.50
Foundry, Boston, delivered	13.50
Foundry, Granite City, Ill.	13.00
Foundry, Alabama	7.75 to 8.25

Semifinished Material

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$42.50
Open-hearth, Youngstown	42.50
Open-hearth, Philadelphia	45.17 to 46.17
Bessemer, Pittsburgh	42.50
Bessemer, Youngstown	42.50
Forging, Pittsburgh	47.50
Forging, Philadelphia	53.67 to 55.17

SHEET BARS

Open-hearth, Pittsburgh	$42.50
Open-hearth, Youngstown	42.50
Bessemer, Pittsburgh	42.50
Bessemer, Youngstown	42.50

SLABS

Pittsburgh	$42.50
Youngstown	42.50

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh $51.00

Standard extras, $2.50 per ton over ¼ inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	2.40c to 2.45c
Universal skelp, Pittsburgh	2.40c to 2.45c
Sheared skelp, Pittsburgh	2.40c to 2.45c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.50c
Structural shapes, Phila.	2.72c to 2.82c
Structural shapes, New York	2.74c to 2.84c
Structural shapes, Chicago	2.60c
Tank plates, Pittsburgh	2.50c
Tank plates, Philadelphia	2.82c
Tank plates, New York	2.84c
Tank plates, Chicago	2.60c
Bars, soft steel, Pittsburgh	2.40c
Bars, soft steel, Philadelphia	2.72c
Bars, soft steel, New York	2.74c
Bars, soft steel, Chicago	2.50c
Bars, refined iron, Pittsburgh	3.25c to 5.00c
Bars, rail steel, Chicago	2.30c
Reinforcing bars, Pittsburgh	2.30c to 2.40c
Bar iron, common, Phila.	2.72c
Bar iron, common, New York	2.74c
Bar iron, common, Chicago	2.50c
Bars, forging quality, Pitts.	2.65c

Hoops, Bands, Shafting

Hoops, Pittsburgh, large	3.15c to 3.30c
Hoops, Pittsburgh, small	3.50c to 3.75c
Bands, Pittsburgh	3.15c to 3.30c
Cold finished steel bars, Pittsburgh base	3.25c
Steel shafting, Pittsburgh	3.25c
Cotton ties, bundle 45 lb. Pittsburgh	$1.62

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	30.00 to 35.00
Relaying rails, Pittsburgh	30.00 to 34.00
Light rails, 25 to 45, mill	2.25c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	3.15c
Spikes, small railroad, Pitts.	3.50c to 3.75c
Spikes, boat and barge, Pitts.	3.50c to 3.75c
Spikes, railroad, Chicago	3.25c
Track bolts, Pitts. Standard	4.00c
Track bolts, Pitts., small	5.00c to 5.50c
Track bolts, Chicago	4.25c
Tie plates, Pittsburgh	2.60c to 2.75c
Tie plates, Chicago	2.60c

Spike, tie plate and truck bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Wire nails, Pittsburgh	3.00c
Plain wire, Pittsburgh	2.75c
Annealed wire, Pittsburgh	2.90c
Galvanized wire, No. 9 gage, Pittsburgh	3.35c
Barbed wire, painted, Pitts.	3.45c
Barbed wire, galv., Pitts.	3.80c
Polished staples, Pittsburgh	3.45c
Galvanized staples Pittsburgh	3.80c
Coated nails, count keg, Pittsburgh	2.70c
Woven wire fencing (retailers)	65 off
Woven wire fencing (jobbers)	67½ off

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts.	6.50c
Sheet piling base, Pittsburgh	2.55c
Hot rolled strip steel, Pittsburgh stamping quality	3.15c to 3.30c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, 0.100-inch and heavier, base	5.00c to 5.25c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	3.75c to 3.85c
No. 28, bessemer, Pitts.	3.75c to 3.85c
No. 28, open-hearth, Phila.	4.07c to 4.17c
No. 28, open-hearth, Chicago.	4.09c to 4.19c

TIN MILL, BLACK

No. 28, open-hearth, Pitts.	3.85c
No. 28, open-hearth, Chicago	3.84c

GALVANIZED

No. 28, open-hearth, Pitts.	5.00c
No. 28 bessemer, Pittsburgh	5.00c
No. 28, open-hearth, Phila.	5.32c
No. 28, open-hearth, Chicago	5.34c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.00c
No. 10 bessemer, Pittsburgh	3.00c
No. 10, open-hearth, Phila.	3.32c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	5.35c

Tin Plate

Per 100 lb. box

Tin plate, coke base, Pitts.	$5.50

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
¼ to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	63.20 to 65.20
Six-inch and over, Chicago	59.20 to 61.20
Three-inch, Birmingham	59.00 to 60.00
Four-inch, Birmingham	53.00 to 54.00
Six-inch and over, Birmingham	49.00 to 50.00
Four-inch, New York	63.60 to 65.50
Six-inch and over, New York	59.00 to 60.00

Standard fittings, Birmingham, base, $110.00 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B.

Scrap Buying Still Small

Few Sales of Size Are Reported and Quotations Generally Are Nominal—Some Grades Quoted Lower—Rail Offerings Limited

SCRAP PRICES, PAGE 420

Chicago, Aug. 7.—Prices of scrap iron and steel have declined further during the week, but encouragement is found in the fact these declines have not been as great as in the previous week. Heavy melting steel which was down to $16.50 a week ago now is holding steady. Sales continue quiet. One dealer reports a slight improvement. All of the cast grades are dull and prices soft. Railroads have made some heavy awards on lists previously issued. Few new lists developed during the week.

Few Price Changes Noted

New York, Aug. 7.—Iron and steel scrap quotations are nominal with but few price changes and these slightly downward. Clean cast borings have been weakened by lack of demand and the price seems best represented by a quotation of $10.50 to $11. No. 1 steel is quoted 50 cents off, at $12 to $12.50. Grate bars appear slightly weaker than $13 on some transactions and shafting has been sold slightly under present quotations.

Dealers are out of the market in many cases. Some believe the market now is scraping bottom. Consumers are buying in hand-to-mouth fashion.

Railroad offerings are normal but an unusual proportion of unsorted scrap is being offered. This is not welcomed by dealers in the present state of the labor market as the cost of handling and sorting is too great to allow much profit. The Long Island railroad is offering 1800 tons, of which 1500 tons is unsorted. A large list by the Lehigh Valley railroad is expected soon.

Bethlehem Steel Co. is willing to buy steel at $15.50, delivered, but shipments to the Conshocken plant of the Alan Wood Iron & Steel Co. have been held up.

Poor Demand Continues

Philadelphia, Aug. 7.—Iron and steel scrap demand continues poor. One melter bought several hundred tons of melting steel during the past week but otherwise transactions have been small. One cargo of 3000 tons imported from Cuba was rejected by the original purchaser but was absorbed mainly by Harrisburg, Pa. dealers who formed a pool for this purpose. A good deal of scrap was sold during the week as heavy cast to a Harrisburg consumer and as a result prices again declined from the level of a week ago.

Prices Are Nominal

Cincinnati, Aug. 7.—Iron and steel scrap is dull and devoid of interest. Prices for the most part are nominal. Consumers continue out of the market and the only activity is on the part of dealers. The general belief of dealers is that consumers will enter the market on a more liberal basis in September. Offerings of the railroads are comparatively small, largely due to the low prices offered. The Baltimore & Ohio is in the market with a list aggregating 15,000 tons. Country shipments especially from the South, have dwindled. Yards in the country are depleted, especially of agricultural scrap. Dealers report consumers have ordered shipments held for at least two weeks, while plants are undergoing repairs. The Andrews Steel Co., Newport, Ky., is contemplating the closing down of its plant the latter part of this month for repairs.

Price Concessions Made

Boston, Aug. 7.—Mixed borings and turnings have been bought at concessions. Substantial tonnages have been done at $8 and $8.50 here, which represents about $1.50 a ton lower

(*Concluded on Page* 371)

Little Business

Being Done In Ferroalloys—Middlemen Sell Ferromanganese At $115

FERROALLOY PRICES, PAGE 355

New York, Aug. 7.—Sales of a few hundred tons of spiegeleisen have been made during the past week at unchanged prices. The market continues $45 to $47.50, furnace, for 20 per cent metal. The producers continue in a comfortable position, being fairly well sold through August.

Sales of ferromanganese durin~ the past week have been confined to carload lots. The market continues $117.50 duty paid tidewater, although this quotation is regarded as largely nominal.

An improved inquiry for ferroalloys is reported from tool steel makers, although little actual business has been closed the past few weeks. Inquiries for ferrotungsten on Monday totaled about 40,000 pounds of contained tungsten, while inquiries for ferrovanadium included one lot of 10,000 pounds and several smaller lots. Prices are unchanged throughout the list of specialties. Some 50 per cent ferrosilicon is reported sold at $82.50, delivered, in carlots.

Dullness Still The Rule

Pittsburgh, Aug. 7.—Activity in ferroalloys is even more limited than recently was the case. Producers of domestic material and sellers of the imported product, however, expect that heavier buying will be conducted this fall but consumers just now continue to defer action. One sale of five tons in Ohio is noted at $130, Pittsburgh. The carload price is unchanged at $117.50, seaboard base, although sales in the West by middle interests are noted at $115, seaboard base.

Other alloys are likewise quiet although a small lot of ferrochrome, under 2 per cent, was disposed of at 26 cents. The standard grade, 6 to 8 per cent, is quoted at 12 cents by domestic interests while the imported material is quoted at 11½ cents, Baltimore. One inquiry is out for 2000 pounds of ferrovanadium on which $3.50 appears to be the market. No interest can be aroused in connection with ferrotungsten which is unchanged at 95 cents.

One or two inquiries are out for spiegeleisen. It now appears that the American Manganese Mfg. Co., will not turn its furnace over for the production of spiegeleisen until Sept. 1 or later. It is quoting $45 furnace, on 18 to 22 per cent material in fair sized lots. A leading producer continues to quote $45 to $47.50 on 19 to 21 per cent, and $44 to $46.50 furnace, on 16 to 19 per cent.

Dullness Has Few Parallels

Philadelphia, Aug. 7.—Ferromanganese producers and importers say they do not remember a time when demand was as dull as present except in 1921. However the present situation is better than then for the reason shipments are heavy. Consumers generally are taking tonnage in accordance with contracts. The price continues $17.50 duty paid tidewater or furnace but this is nominal as the resale market is around $115. Several small lots of spiegelisen have been sold at $45 furnace.

Demand for Warehouse Stocks Maintained

WAREHOUSE PRICES, PAGE 412

New York, Aug. 7.—Demand for steel products from warehouse continues excellent, August promising to be better than either of the two preceding months. Prices are unchanged and firm. Demand for blue annealed sheets and plates is particularly strong and both these products are moving freely. In other lines there also is steady call.

Prices Are Firm

Cleveland, Aug. 7.—Prices on iron and steel products out of warehouse continue firm and some jobbers report a noticeable betterment in demand. One large warehouse reports it is anticipating a heavy order volume during the fall and is placing its requirements for that period with the mills. The leading interest's warehouse reports its demand is holding up with previous weeks. Some shading of galvanized sheets is understood to have been done, but this is not general.

Stock Demand Fluctuates

Philadelphia, Aug. 7.—Demand for iron and steel products out of stock continues to fluctuate but averages fair size. Prices are firm and unchanged at the quoted levels of some time back.

Asks for Reopening of Assigned Car Case

Washington, Aug. 7.—The Youngstown Sheet & Tube Co., owning 15,000 acres of coal lands in Pennsylvania and West Virginia and 1300 standard steel hopper-bottom coal cars, today asked the interstate commerce commission to reopen the assigned car case. The company pointed out that it had submitted no evidence because it did not understand that the assigned car practice as

it relates to industry was under fire and because the action was instituted upon the commission's own motion.

The decision, now effective Oct. 1, will deny to the company the use of coal cars to the extent the placement of cars at its mines exceeds the pro rata share of railroad-owned cars to which other mines in the district are concurrently entitled to. The company alleges: "In no other instance in the entire history of regulation of interstate commerce by the interstate commerce commission has so important an order so vitally affecting important interests to shippers or receivers of traffic been made upon a record so devoid of evidence disclosing the circumstances and conditions of the transportation, traffic and business affected."

Tin Plate Tonnage

To Be Carried Into Fourth Quarter—May Defer New Price

TIN PLATE PRICES, PAGE 355

Pittsburgh, Aug. 7.—So much tonnage of tin plate will be carried into October by the American Sheet & Tin Plate Co., that its fourth quarter price announcement, due Aug. 15, may be deferred. None of its customers will be able to obtain any more tonnage than is coming to them in October; hence there is no need for haste concerning a new price. With specifications due by Aug. 15, the leading interest will have enough tonnage to keep its mills active on the present basis until the end of October. This delay will give producers an opportunity to line up their production costs and to ascertain increased costs traceable to the inauguration of the 8-hour day in open-hearth and bessemer plants. Specifications involving heavy tonnages are numerous and many demands are being made for faster shipments. Efforts to supply the needs of container manufacturers for perishable food cans are being met and while in some cases other lines of tin plate consumption have had to step aside for a time, everything possible is being done to increase shipments so as to treat everybody with fairness. Some of the oil companies keep up a constant bombardment for tin plate tonnages. The market price is unchanged at $5.50 per base box of 100 pounds, Pittsburgh.

Specifications Are Good

Philadelphia, Aug. 7.—Good specifications continue to feature the tin plate market. While some stock is selling at $5.25 per base box Pittsburgh, the usual price is $5.50 to $5.75.

More Mine Fatalities

Washington, Aug. 7.—One hundred and seventy-two lives were lost in coal mine accidents in June or at the rate of 3.18 per 1,000,000 tons of coal mined, the bureau of mines states. This brought the total of fatalities for the first half of the year up to 1221 and the fatality rate to 3.76, compared with 868 fatalities and a rate of 4.14 for the first half of 1922.

Semifinished Trade Quiet

Deliveries Being Made to Some Users Faster Than They Can Consume Material—Fourth Quarter Reservations Taken

SEMIFINISHED STEEL PRICES, PAGE 355

Pittsburgh, Aug. 7.—The semifinished steel market remains quiet. Most users have deliveries coming to them on contracts at a faster rate than they can be utilized owing to the hot weather and labor shortage. No inquiries now are out for either sheet bars, billets or slabs. One maker jokingly quoted $15 Pittsburgh, to a nearby user on 2000 tons of 1¼-inch billets and when told to ship, said: "I will not; I merely wanted to see if there was a figure namable that would bring about some buying." The last sales of forging billets recorded over a week ago were all small and carried the $47.50 base Pittsburgh, price. At present no inquiries are before the trade for this product.

Consumers of wire rods, particularly in the Beaver valley, possibly would place additional orders if the steel were immediately available. Several makers, however, need all that they produce either to apply upon their contracts or in their own finishing departments. Specifications on such contracts are coming in with a fair degree of promptness but no new sales recently have been consummated. From $51 to $52.50 base Pittsburgh, still is the market's spread.

Skelp at 2.40c, for either sheared, universal or rooved finds no takers, but deliveries on contracts continue to be made. One important interest recently closed on a few thousand tons in the open market.

Eastern Billet Sales Small

Philadelphia, Aug. 7.—Billet business is restricted to small lots, although some sales of a couple hundred tons each are included in the week's transactions. The current market is $48.50 to $50, base Pittsburgh, for forging quality and $40 to $42.50 for the rerolling grade.

Specifying at $42.50

Youngstown, O., Aug. 7.—While persistent rumors are in circulation to the effect that sheet bars are being offered by an Ohio producer at $40, Youngstown, these lack confirmation. In view of the fact that consumers are specifying right along against their sheet bar contracts it is doubtful whether they would continue to do so if $40 sheet bars were obtainable. A checkup of prices this week failed to disclose any tendency to quote lower than $42.50, Youngstown, on any grade of semifinished steel. The market is quiet as far as new business is concerned.

Making Some Reservations

Cleveland, Aug. 7.—While the leading maker of semifinished material in this district has not formally opened its books for the fourth quarter reservations have been made for that period for some of its customers, prices to be in line with those quoted at time of delivery by IRON TRADE REVIEW and other trade publications. No additional business has been concluded for delivery in this quarter. While it is too early to gage the effect of the changes now being brought about in the working time of steel plant crews, some influence is manifesting itself in a firmer attitude of producers, and it is doubtful if anything below $42.50 can be done on sheet bars, billets and slabs.

Wire Makers

Discharging Obligations—Some New Business Coming Up

WIRE PRICES, PAGE 355

Pittsburgh, Aug. 7.—Headway is being made in the discharge of obligations by makers of wire products in this district. New specifications arrive from time to time although new orders are not so numerous as they were. Limited new buying is traceable to the fact the majority of customers have anticipated their needs for 30 to 60 days ahead. Present demand centers in nails and bright wire although occasionally mixed carloads containing other wire products are among the orders received from jobbers scattered over a wide area. Bright wire at 2.75c and nails at 3.00c, base Pittsburgh, continue to represent the market bases. So much demand is being experienced by the Bethlehem Steel Co. in the East for wire products that nothing is left for disposition by its Pittsburgh office. All makers are able to report fairly heavy bookings of cement coated nails, the majority being obligated for six to eight weeks ahead. Wire operations still are between 70 and 80 per cent of capacity.

Retail Stocks Low

Chicago, Aug. 7.—While retail stocks of nails and wire products are reported low throughout the West, the expected buying improvement holds off. Manufacturers are working on old orders for nails, and are so far behind delivery under 60 days is difficult to secure. Fencing, particularly barbed wire, is offered for prompt delivery. Market authorities are cheerful and look for a buying movement of some magnitude within two weeks. Actual orders for wire products have shown a slight decrease below those of a week ago. Inquiry is undiminished.

Pig Iron Stocks Gain

Birmingham, Ala., Aug. 7.—Surplus stocks of pig iron in Alabama on Aug. 1 totaled 83,934 tons, an increase of 35,486 tons compared with stocks of 48,448 tons on yards on July 1. Of the total, 57,985 tons was sand cast which compares with 28,967 in July; 12,185 tons of machine cast compared with 12,185; 500 tons of warrant compared with 800 in July and 13,246 tons of basic compared with 13,057 on July 1.

Bar Buying Stimulated

Improvement in Orders and Inquiries Is Reported Generally—Auto Builders Figure in New Buying—Quotations Continue Steady

BAR PRICES, PAGE 355

Chicago, Aug. 7.—The soft steel bar market continues to improve. Practically all producers report better inquiry and sustained orders. The leading independent has had shipments balanced by new business so that deliveries still are far behind. Prompt business is being forced to eastern mills. The price holds firm at 2.50c, Chicago. Sales at 2.55c have practically disappeared.

Bar iron sales show slight improvement over a week ago, but the price has softened in the trading of the last few days and sales now are being made at 2.40c, Chicago.

Rail steel bars still are in the midst of a prolonged lull. Mill production has held up fairly well and as a result backlogs are rapidly vanishing. Surprise is expressed that the price holds unchanged at 2.30c, Chicago. This seems indicative of confidence in future trade.

Surprised At Sustained Price

Pittsburgh, Aug. 7.—Producers of merchant steel bars are surprised at the continued firmness of the market price, 2.40c base Pittsburgh. Ordinarily during a lull in new buying considerable weakness is developed but the trade generally finds the market strong on that basis. Undoubtedly this strength is brought about by the expectation the inauguration of the 8-hour day will necessitate a slight advance. Specifications represent a fairly large aggregate tonnage and occasionally a new order is noted. In some cases, specifications involve several hundred tons. Some users have all of their August and a part of their September specifications in; others now are commencing to line up their September requirements while one or two are sounding out producers in connection with October tonnage. Various lines of use are represented in the orders now upon the books of makers and with no suspension or cancellations, shipments are being speeded up.

No particular change is noted in connection with refined iron bars, 3.25c to 5.00c continuing to represent the spread of the market except on those forms of special irons selling at higher levels than that maximum. Demand is heavier.

Specifications Are Stimulated

Cleveland, Aug. 7.—Higher extras of $2 to $20 per ton on bars and small shapes recently adopted by the mills do not apply to contracts already on mill books and this fact is stimulating specifications by consumers against tonnage placed some time ago. All the mills report a materially increased tonnage being received from consumers in this territory at the present time as compared with July which in turn was better than June. Some of these individual lots are of good size, exceeding 1000 tons. Automobile builders have figured in these orders although the demand is general. Fill-in orders are better but not large. Prices are firmly maintained at 2.40c, Pittsburgh. Price irregularity continues in those thicknesses and widths of hoops and bands which come into competition with strip steel. On light and narrow hoops where recently 3.50c was paid, some business recently has been done at 3.30c and lower. This is a new development of easiness for the heavier hoop sizes or lighter bands have been irregular for some weeks and continue so.

Market Tone Is Strong

Philadelphia, Aug. 7.—Steel bar specifications continue large and new demand is fair. Altogether a strong tone characterizes the market, which continues 2.40c Pittsburgh on bars rolled from new material. Lower is being done on resale bars.

Cold-Drawn Specifications Large

Pittsburgh, Aug. 7.—Specifications on cold-drawn steel bar contracts are fairly voluminous but new buying only is fair. In two or three cases makers report new orders are limited; others receive carload orders from time to time with an occasional sizable tonnage, one such being placed this past week for several hundred tons of one size. Shipments continue in excess of new business and one prominent maker reports approximately 50 per cent of July shipments were on the basis of the last announced price, 3.25c base Pittsbugh, which generally is firm. One or two small mills in the West and one in the East are offering price concessions of $1 or $2 per ton quoting as low as 3.15c in a few isolated cases. Backlogs of heavy orders taken last March are being reduced with a fair degree of rapidity and specifications being received continue to come from diversified sources. More sizable ones from the automotive lines are expected later in the month.

Bolt, Nut, Rivet Orders Are in Fair Volume

NUT AND BOLT PRICES, PAGE 416

Pittsburgh, Aug. 7.—Nut, bolt and rivet buyers continue to file specifications on standing contracts. In connection with rivets, these are proportionately less than for nuts and bolts. Most jobbers have supplied their wants for the time being; railroad interests are found among the larger buyers. New demand from all directions still remains low although from time to time a fairly large number of single carloads are placed. The market continues unchanged on the basis of 50, 10 and 10 per cent off on large machine bolts. As indicated, rivets are quiet and as usual this condition promotes competition. On attractive business as low as 3.00c and 3.10c, base Pittsburgh, respectively, are the prices done on structural and boiler rivets; the regular market prices are 3.25c and 3.35c, respectively. On smaller rivets, 65 and 5 off is the regular discount, while on attractive lots some makers have gone as low as 65 and 10 off.

Seasonable Lull Continues

Chicago, Aug. 7.—Nut and bolt makers continue to operate close to 75 per cent of capacity, but new business has fallen off during the past week. The expected fall demand still holds off. Railroads are almost the only buyers. Prices are soft and several grades which were quoted 60 and 5 off now are quoted 50, 10 and 10 off.

Quotations Are Firmer

Cleveland, Aug. 7.—Firmer quotations on bolts, nuts and rivets are reported by producers here. For some time past discounts on these products have been increased by certain makers in an effort to obtain going business, and on rivets this shading ranged from $1 to $3 a ton. On bolts and nuts the price shading was not as great as on rivets and as a result of the higher bar extras and the possibility of higher steel bar prices shading is rapidly disappearing. One large bolt maker reports July bookings were the second heaviest so far this year, March business exceeding July by a small margin. While the rivet prices are firmer it is understood concessions of $1 to $3 a ton still are available on desirable business.

Hoop Shipments Large

HOOP PRICES, PAGE 355

Pittsburgh, Aug. 7.—Shipments of hoops and bands on contracts constitute the major market activity at present, new orders being scarce. While one or two makers have 80 to 90 days' business ahead, the majority have 30 to 60 days' obligations on their books. Specifications are fairly large. From 3.15c to 3.30c, base Pittsburgh, continues to represent the general market's spread although isolated cases are reported where an even lower figure has been developed.

Large Ore Shipments

ORE PRICES, PAGE 416

Cleveland, Aug. 7.—Final shipments of Lake Superior iron ore in the last few days of July brought the total for the month to 10,411,248 tons, while the estimate given in the Aug. 2 issue of Iron Trade Review, based on shipments up to July 27, was 10,300,000 tons. The largest amount ever brought down in one month was 10,659,000 tons in July, 1918. The total this year up to Aug. 1 is 26,596,731 tons, and shippers say this indicates a movement of about 60,000,000 tons for the season.

Export Demand Stronger

New York, Aug. 7.—More life features the export demand for steel products than in some time. This is principally by reason of the improved demand from the Far East. Japanese buyers are in the market for considerable sheet tonnage. Their inquiries each involve all the way from 800 tons downward. The requirements wanted are mostly black sheets. In addition there is some other inquiry from Japan, notably for plates. The Imperial Government railways of Japan

continue in the market for rails. On tin plate business for Japan, British mills continue in a predominating position. It is understood that the latest inquiry of the Nippon Oil Co., for 19,000 boxes of tin plate, has just been placed with British makers. There is some inquiry from Cuba for steel products but the British makers still are in a favorable position with respect to prices on Cuban business.

Steel Treaters Plan for Annual Convention

The fifth annual convention of the American Society for Steel Treating and the International Steel exposition will be held in Motor Square garden, Pittsburgh, during the week of Oct. 8. Some of the keenest minds of the country in this field of service will furnish the papers for the technical program to be presented during the five-day convention. Papers have been secured from Japan, England, France and Germany, and these together with the large number of papers to be presented by America's foremost metallurgical engineers all combine to make the strongest technical sessions ever held by this society.

The International Steel exposition is held during the convention under the auspices of the American Society for Steel Treating. An increase of 25 per cent over the floor space used last year has been arranged for the Pittsburgh show. The 50,000 feet of exhibit space will be given over to a display of metals, metal working machinery, appliances and equipment for the steel treating department that will be most interesting and comprehensive. Many exhibitors plan to have the machinery shown in actual operation.

West Virginia Furnaces Running 90 Per Cent

Wheeling, W. Va., Aug. 7.—There are few inquiries for standard basic iron in this district. Operators still are working ahead of contracts and production runs near the 90 per cent mark. Every furnace in the Ohio valley between Wierton and Portsmouth, with the exception of the Belmont of the Wheeling Steel Corp., is in operation. This furnace is obsolete and no longer considered a part of the producing unit.

Furnace interests show little inclination to any further price cutting. Commitments are on a $26 basis with a slight shading for very desirable business. Though signs of immediate recovery are few, producers in general refuse to be alarmed over the situation and feel that the bottom has been reached and that the next few weeks will see some improvement.

Semifinished lines are somewhat more active but orders are small. There are signs of still further revival of interest and prices are distinctly firm. Sheet bars are quoted $42.50, Wheeling.

The L. S. Starrett Co., the Athol Machine Co., the Athol Mfg. Co., and the Union Twist Drill Co., all of Athol, Mass., shut down July 28, for two weeks.

Plate Sales Satisfactory

Good Volume of Business Continues To Be Done in Moderate Tonnages—Early Deliveries Difficult—Price Remains Firm

PLATE PRICES, PAGE 355

Philadelphia, Aug. 7.—Eastern plate mills report a continued good volume of miscellaneous new business. On the whole, however, new business now is well under the rate of shipments. Most mills still are behind on deliveries. Current production of eastern mills continues around 30 per cent. The Baltimore & Ohio, Cheasepeake & Ohio and Norfolk & Western railroads have not yet acted on recent inquiries. These aggregate around 10,000 tons. Pittsburgh mills, on account of having taken considerable tonnage in the Middle West recently, continue unable to offer nearby deliveries. The price of plates continues at 2.50c, Pittsburgh, equivalent to 2.82c, delivered, Philadelphia.

Plate Sales Drop Off

Chicago, Aug. 7.—While inquiry is well sustained, actual orders for plates during the past week dropped off somewhat due to the absence of round tonnages in the market. The oil companies have not closed on any important business. The Sinclair Oil Co. which placed two orders for 30 tanks each some time ago, is now inquiring for plates for 30 tanks additional. Railroads are working on heavy repair programs, which undoubtedly will develop a large plate tonnage in the near future. The Great Northern railroad has received bids on 700 tons of plates for bridge construction and is expected to buy during the coming week. Mills continue to find difficulty in satisfying customers with delivery. Orders and shipments continue to nearly balance. The price 2.60c, Chicago mills, has been shaded slightly in some orders which have just come to light, but most figures have been placed at 2.60c.

Tankage Inquiries Still Current

Pittsburgh, Aug. 7.—Comparative quietness exists in the plate market this week, for the reason that while a large number of oil tank inquiries still are out they are for immediate shipment and fabricators cannot make delivery inside of three to six months. The inquiries mainly are for 55,000 and 80,000-barrel tanks for western fields, chiefly California and Texas, and are estimated to involve around 15,000 tons of plates. No tankage awards are noted here this week except a few single tanks of small capacity. Various fabricators have placed additional plate tonnage with Mahoning valley and other steel companies lately and report the market firm at 2.50c, base Pittsburgh. In fact, in one or two cases premiums have been paid for prompt deliveries, creating prices such as 2.60c and 2.75c f. o. b. Pittsburgh. Various small inquiries are current for plates of various kinds, including tank plates, 50 to 300 tons at a time. Platemakers generally are filled up for 30 to 90 days and are operating on an average of 88 per cent of capacity.

New Volume Is Good

Cleveland, Aug. 7.—A firm market with a good volume of new business continues to represent the situation in plates. A Columbus consumer is reported to have placed 3400 tons and while details are lacking it is believed this was for car construction. A new inquiry is current for 20 stills for Standard Oil construction involving 600 or 800 tons. Early awards against the inquiries for four or five new vessels pending before lake yards are not likely as these negotiations have been deferred temporarily. These projects may be revised later. The general plate price remains 2.50c, Pittsburgh, but early deliveries are not available at that figure owing to the filled-up condition of the mills. The larger producers still are not making promises under three to four months. Higher prices continue to be paid for early deliveries. One lot of fair size for three or four weeks' shipment went at 2.70c, Pittsburgh, while a smaller quantity for delivery in a week to ten days was closed at 2.55c, Pittsburgh. Local mills are quoting from 2.50c to 2.60c, Pittsburgh and are able to make fairly early deliveries. Eastern makers are quoting the same range of prices at the mill.

Indiana Represented in Pittsburgh Case

Indianapolis, Ind., Aug. 7.—Governor McCray of Indiana has announced that he has authorized U. S. Lash, attorney general, to attend a conference to be held in Chicago by attorneys general of several middle western states, for the purpose of planning further details of the case before the federal trade commission seeking the abolishment of the Pittsburgh plus method of fixing steel prices. The governor said he was opposed to this method of fixing steel prices, but that Indiana's co-operation in an effort to abolish the method would depend on Mr. Lesh's report on the conference. Both houses of the 1923 general assembly passed resolutions expressing opposition to the Pittsburgh plus plan.

Chicago Is Unchanged

Chicago, Aug. 7.—Operations at steel plants here remained practically unchanged during the week. The Illinois Steel Co. reports operations at approximately 93 per cent with two blast furnaces down for repairs. This leaves 25 of its 27 steel works stacks operating. Its merchant furnace at Milwaukee is active. The Inland Steel Co. is operating its bar mills about 75 per cent of capacity and some other departments close to 80 per cent.

All of the companies in this district are reticent on the subject of eight-hour day plans, but it is understood these have progressed further than generally supposed. At least one interest is known to have recently renewed its efforts to secure additional workmen.

Concrete Bars Still Weak

Heavier Tonnages in Prospect Although Present Lettings Are Small—Hard Steel Bar Dealers Adopt New Extras

REINFORCING BAR PRICES, PAGE 355

Cleveland, Aug. 7.—Large buyers of concrete reinforcing bars continue to hold off purchases in anticipation of lower prices. Inquiry and awards of small tonnages continue unabated, with some local contractors reporting that the total tonnage closed in July was the largest for any month this year. Although there is a tendency to shade 2.75c, Pittsburgh, for material out of stock because of the lull in demand, the increasing inquiry is expected to prevent any sharp weakness. Some dealers, however, continue to unload stocks at concessions. Some shading of 2.40c, base Pittsburgh, the mill price on new steel bars, is being done, buyers quoting rerolled prices for competition. Although the general market on rerolled bars continues at 2.30c, base mill, some of this business is going as low as 2.25c and 2.20c mill. The Standard Oil Co. of Ohio continues to purchase carload and less-than-carload lots of bars for local construction, the tonnage bought by this company recently aggregating a considerable total.

Greater Activity Anticipated

Washington, Aug. 7.—Greater activity in the reinforcing concrete bar market seems in prospect for this fall. The district board of education is considering several building projects and has almost committed itself to one extension that should take about 250 tons of bars. Bids are now in for the Central Union Mission building which will require about 100 tons. No other projects are definitely out at this time but the expectation is that some fair-sized tonnages will be sought in the fall. The market continues at 3.50c to 3.75c, Washington warehouse.

Awards Involve Small Lots

Pittsburgh, Aug. 7.—Small unimportant tonnages alone are noted this week in connection with reinforcing concrete bar activity. These usually comprise single carloads or less-than-carload quantities. The mill price is unchanged at 2.40c, base Pittsburgh. Fabricators continue to quote 2.50c to 2.75c from warehouse, depending upon the quantity involved. A number of inquiries are pending for various tonnages although no outstanding amount is up in current negotiations. Prospective business involves several fair sized quantities for local and nearby bridges.

Heavy Tonnage Pending

Chicago, Aug. 7.—Activity in the concrete bar market holds up favorably. Most dealers report as many jobs on hand to figure as they are well able to take care of and the outlook is even more favorable than it was a week ago. Awards of the past week held up well for this season of the year, although most of the work was for relatively small tonnages. The Truscon Steel Co. secured 500 tons for new bridges across the Chicago river. The Kalman Steel Co. closed on 100 tons for a bridge for the State of Illinois and on considerable other tonnage. Contracts for 100 tons of bars for roadwork in Racine, Wis, went to the Corrugated Bar Co. The most conspicuous item in the pending business is 900 tons for the outbound freight house at Chicago of the Chicago, Burlington & Quincy railroad. The price holds firm at 3.60c, Chicago.

CONCRETE CONTRACTS PLACED

Awards this week	**3,028 tons**
Awards last week	**1,375 tons**
Awards two weeks ago	**4,565 tons**

800 tons, building for Western Electric Co. at Kearney, N. J., 400 tons each to Concrete Steel Co. and Kalman Steel Co.
621 tons, contract No. 2, mole type pier for San Diego, Cal., to Edw. L. Soule Co.
500 tons, bridges for city of Chicago, to Truscon Steel Co.
422 tons, Kern General hospital, Bakersfield, Cal., to unknown bar jobber.
200 tons, Winn garage, Chicago, fabricator not stated.
185 tons, for Du Bois, Pa., waterworks, to an independent steel company.
100 tons, roadwork for Racine county, Wis., to Corrugated Bar Co.
100 tons, St. Francis hotel addition, San Francisco, to W. S. Wetenhall & Co.
100 tons, for West Penn Power Co., Pittsburgh, through Sanderson, Porter Co., to Concrete Steel Co.

CONCRETE CONTRACTS PENDING

6000 tons, sanitary sewage disposal plant, Chicago; bids in.
1000 tons, power house for New York Edison Co., New York; pending.
900 tons, outbound freight house, Chicago, Burlington & Quincy railroad; bids close Aug. 18.
350 tons, terminal warehouse, Second and Brannan streets, San Francisco; bids being received.
300 tons, State street bridge, Akron, O.; T. E. McShaffrey, general contractor. Plans being revised.
300 tons, plant for Pittsburgh Plate Glass Co., Milwaukee, pending.
250 tons, foundations for Hall of Justice, Los Angeles; bids in Aug. 20.
200 tons, 7-story warehouse for Bekins Fireproof Storage Co., Geary and Emerson streets, San Francisco; bids being received.
200 tons, Elks club, Santa Rosa, Cal.; bids being received.
200 tons, club house at Olympia fields, Chicago; bids being taken.
180 tons, three buildings for Standard Underground Cable Co., at Emeryville, Cal., bids asked.
170 tons, stage depot for Pickwick Stage Co., San Francisco; pending.
150 tons, drill hall in connection with the Chicago armory; bids being taken.
120 tons, 3-story building for Havens Co., Oakland, Cal.; bids being received.
105 tons, five bridges for Napa county, California; John H. May awarded general contract. Bars not yet placed.
100 tons, new building for Central Union Mission, Washington; bids in.
100 tons, power house and engine house for Pennsylvania railroad, Columbus, O.; R. H. Evans, general contractor.
100 tons, Exchange bank, Franklin, Pa.; Hunkin-Conkey Construction Co., general contractor.

Strip Tonnage Pleasing

STRIP PRICES, PAGE 355

Pittsburgh, Aug. 7.—Pleasing tonnages of both hot and cold-rolled strip steel continue to be specified by users in different sections fed by this market. During the past week or 10 days, increased tonnages have been asked for by automotive interests and this probably will grow from now on since good business is expected by the various automobile companies throughout the fall. Other lines of consumption are furnishing their quotas of specifications on old orders although new buying continues limited. From 5.00c to 5.25c continues to represent the market on cold-rolled strip steel while on hot-rolled 3.15c to 3.30c base Pittsburgh, still are the levels obtainable, the maximum being maintained by independents here.

Improvement in Demand

Philadelphia, Aug. 7.—Some improvement was noted during the past week in demand for hot-rolled strip steel. The 3.30c base Pittsburgh price now has practically disappeared, and the prevailing quotation is 3.15c and in some cases contracts at 3.30c have been revised to 3.15c. Some slight improvement also is noted in cold-rolled strip steel which continues 5.00c to 5.25c, base Pittsburgh.

Pipe Demand

Continues Heavy as Jobbers Seek Tonnage—Mills Heavily Booked

PIPE PRICES, PAGE 355 AND 416

Pittsburgh, Aug. 7.—Heavy demands for standard full weight merchant pipe still are being made upon the tubular goods makers in this and the Mahoning valley districts. Demand originates mainly among jobbers. Daily calls are being made for larger shipments. Operations are as high as possible, pipemaking being approximately 90 per cent on the average although pipe-finishing is not that high. It still is difficult to obtain threaders and couplers, particularly on large diameter pipe. Mills, however, are in an improved position in this regard as compared with a few weeks ago and consequently are not now so anxious for plain-end pipe orders as they were.

Effective Aug. 1. the Wheeling Steel Corp. issued a new card of standard full weight pipe extras to bring its prices into line with the cards of April 19, 1923, of the National Tube Co. and independent producers. This virtually was a reduction of $2 per ton for this interest since its discount prior to Aug. 1 was one point below that of the other producer.

New orders for oil country goods are limited and practically the only activity in line pipe, casing, etc., is in connection with material wanted on old orders. From time to time fair sized orders for line pipe, etc., are placed, such as one awarded a local independent pipe producer recently by the Atlantic Refining Co. This order called for 25 miles of 6-inch line pipe, about 1275 tons. Curtailed activity in the oil fields is limiting new drilling.

Year's Pipe Well Sold

New York, Aug. 7.—Little inquiry for cast iron pipe is coming out as shops are so well filled deliveries cannot be given short of November and December. The result is that cities are not interested and remain out of the market. Private buying for industrial and other purposes is also small.

The only large business now in view

for immediate placing is about 5000 tons of 20 to 30-inch pipe for the city of New York, bids on which will be taken through contractors this week. About 5000 tons of 36-inch pipe has been placed by the same city with contractors. About half this tonnage has been taken by the United States Cast Iron Pipe & Foundry Co.

Large Contracts Held Up

Chicago, Aug. 7.—A temporary lull in large cast iron pipe contracts has developed here in the past week and almost no sales or inquiry above 100 tons are reported. The Sanitary district, Chicago, has opened bids on 2000 tons, but is not expected to buy more than one-third of this. Contract for 2000 tons for the city of Minneapolis was placed with the American Cast Iron Pipe Co., and this same company, secured 350 tons for the City of Niles, Ill. The city of Cleveland is understood to be in the market for 1000 tons. Prices are unchanged.

Winter Prospects Brighter

Birmingham, Ala., Aug. 6.—Cast iron pipe prices are being maintained here, the only concessions noted being where delivery is extended into January. Winter prospects are bright, local makers being comfortably booked. Lettings are coming in slowly but there are some larger specifications in sight. American Cast Iron pipe Co. received an order for 350 tons from Rio Grande, Porto Rico; 680 tons from Rosedale, Kansas and 1153 tons from Los Angeles. The United States Cast Iron Pipe & Foundry Co. received some business from California while the National Cast Iron Pipe Co. has had a few scattering orders.

CAST IRON PIPE AWARDS

5000 tons of 36-inch pipe for New York City; half of this tonnage went to the United States Cast Iron Pipe & Foundry Co.
3090 tons of 4, 6 and 8-inch pipe for Los Angeles to the American Cast Iron Pipe Co.
2000 tons for Minneapolis to the American Cast Iron Pipe Co.
1153 tons for Los Angeles to the American Cast Iron Pipe Co.
680 tons for Rosedale, Kans., to the American Cast Iron Pipe Co.
350 tons for Rio Grande, Porto Rico, to the American Cast Iron Pipe Co.
350 tons, for Niles, Ill., to the American Cast Iron Pipe Co.
164 tons of 12-inch class B pipe for Glendale, Cal., to the United States Cast Iron Pipe & Foundry Co.

CAST IRON PIPE PENDING

8000 to 10,000 tons of 84-inch pipe for Los Angeles; outfall sewer, bids opened July 30; want reinforced concrete pipe.
5000 tons of 20 to 30-inch pipe for the city of New York; bids to be taken soon.
2200 tons of 4, 6 and 8-inch class C pipe for Montesito, Cal.; bids opened Aug. 1.
900 tons of 4, 6 and 8-inch pipe for San Bruno, Cal.; United States Cast Iron Pipe & Foundry Co., low bidder.
112 tons of 4 and 6-inch class B pipe for Alhambra, Cal.; bids opened July 30.

Otis Earnings Higher

Net profits of the Otis Steel Co. for the first six months of this year were $809,823. Of this total $248,969 was earned in the first quarter and $560,854 in the second. Manufacturing profit for the half just ended was reported as $1,558,493.

The Foster Machine Co. of Elkhart, Ind., has increased its capital stock from $500,000 to $1,000,000.

Sheet Specifying Heavy

Motor car Builders Taking Good Tonnages—Interest Centers in Fourth Quarter Prices—Some Shading Reported in Black

SHEET PRICES, PAGE 355

Youngstown, O., Aug. 7.—Activity in the sheet market here involves principally the scheduling of specifications against contracts, rather than new business. A good volume of inquiry is in circulation for blue annealed and galvanized and fair size tonnages are being entered at 3.00c and 5.00c, respectively, base, Pittsburgh. At certain mills the blue annealed business booked over the week averaged 500 tons per order. Black sheets, however, are the weak spot in the market with the majority of producers in a position to offer an attractive delivery date. In view of the lack of demand for this grade the market has become sensitive from the standpoint of prices and on two sales consummated outside this district 3.75c, Pittsburgh, is understood to have been done. Whether the sales represented production or warehouse sheets could not be learned. As far as Mahoning valley producers are concerned, however, no specific instance can be found where black tonnage for production is being entered on mill books at 3.75c. While the tonnage taken last week by several of the mills here was not large yet all sales were made at 3.85c base, Pittsburgh, as far as could be ascertained. It is true that sheet mill operation in the district has declined to 66 per cent of capacity, the lowest rate reached this year not considering the shutdown of last month, but producers as yet have not reached the point where they are destitute of business as is shown by the fact that sheetmakers who buy sheet bars in the open market show no inclination to cut down their weekly specifications. The situation, however, will bear close watching in view of small entries and the quiet effort being made by certain consumers to beat down prices. High-grade sheets continue firm at 5.35c, for 22 gage, Pittsburgh. All third quarter production of one producer here is under contract and the question of opening books earlier than usual for fourth quarter trade is being considered seriously. Two producers of high grade sheets in a nearby district will have a larger carryover than was contemplated and from present indications they will not be in a position to ship against new business until well into October.

The Weirton Steel Co., Weirton, W. Va., is offering black, blue annealed and galvanized sheets for October delivery against its new sheet plant now nearing completion.

Pay 3.85c For Black

Philadelphia, Aug. 7.—Sheet specifications continue good, though new demand is small. Current business continues in less volume than shipments, hence most of the mills welcome specifications. Blue annealed and galvanized sheets continue to be held firmly at 3.00c and 5.00c, Pittsburgh, respectively. Black sheets continue to be offered by some mills at 3.75c. It is a notable fact, however, that consumers generally are adhering to regular sources of supply and paying 3.85c as a rule.

Fourth Quarter Interest Keen

Pittsburgh, Aug. 7.—Considerable interest on the part of sheet consumers is manifested in expected price announcements for fourth quarter. This applies particularly to customers of the American Sheet & Tin Plate Co. They are anxious to learn to what extent prices will advance due to the 8-hour day. While the sheet and tin plate industries are not directly affected by the new program since they are on an 8-hour day basis, a large proportion of sheet and tin bars have to be purchased and the sheet bar producers are directly affected by the change in policy. In this way production costs will be measurably increased. These price announcements probably will be deferred as long as possible so as to permit sheetmakers to obtain a proper perspective of their costs.

Some of the independents expect to receive shortly specifications on their customers' September requirements but the American company already has almost 85 per cent of its obligations in the form of actual specifications. By Aug. 15 the remainder is due and the aggregate tonnage obligation involved cannot be discharged before the end of October; hence, it will not be in any hurry to make a price announcement. In the meantime specifications coming in are heavy for all kinds of sheets. During the last several days the specifying of automobile sheets has gained considerable impetus owing to the fact that those automobile companies who have been delayed in putting out their new models, are now able to tell what sizes of sheets they will want.

Operations generally are unchanged from a week ago, for while a few more mills may be active here and there, the hot weather and extreme humidity has cut down output. From 80 to 85 per cent is the general average. Prices are unchanged, 3.00c for blue annealed, 3.85c for black, 5.00c for galvanized, and 5.35c for full-finished automobile sheets, all base Pittsburgh. No trace of a 3.75c price on black sheets is found among the mills in this vicinity except in isolated cases where single carloads from mill or warehouse stocks have been disposed of at a sacrifice, or where some stocks have been liquidated.

Shipments Still Far Behind

Chicago, Aug. 7.—Sheet mills here continue to operate at about 75 per cent of capacity, and orders entered during the past week are reported as below shipments. Nevertheless deliveries still are far behind and makers seem indifferent to new business, despite the fact that demand is relatively quiet. One of the principal mills reports prices decidedly firmer. No. 28 black still is quoted at 4.19c, Chicago.

Shape Demands Heavier

Return of Large Buyers Lends Confidence to Market—Increased Inquiry Reflects Beginning of Fall Buying

STRUCTURAL SHAPE PRICES, PAGE 355

New York, Aug. 7.—While a number of projects involving large tonnages of structural material are still upstage and promise to give large bookings later in the year, the immediate present is developing an unusual number of inquiries for small lots, mostly of an attractive character, which fabricators appreciate. Shops are well filled for several months and are in a comfortable position. Of the larger projects still unplaced a number are on the verge of being closed and the next fortnight is likely to see a large tonnage covered. On the Perth Amboy bridge, a state highway project, which will involve about 4000 tons, at the present time, bids will be received Sept. 14, which gives ample time for figuring. Several apartments and schools involving 400 to 500 tons of steel are in prospect. One fabricator judges the situation from the fact his inquiries increased from four to fourteen since last week, indicating a broader market. Plain material is steady at 2.50c, Pittsburgh, and no indication of a change is seen, unless it be upward when demand begins to increase in the fall.

Eastern Bookings Improve

Philadelphia, Aug. 7.—Demand for plain shapes has improved and in some cases eastern mills report that new bookings in the past week or two have exceeded shipments, despite the fact that the latter are being made at from 80 to 90 per cent of capacity. The outlook for the fall is considered good as more structural work is in sight than for some time. Considerable interest here is centered around the large tonnages required for the Delaware river bridge, on which bids will open Aug. 15, and for the new Ford Motor Co. assembling plant in this city. Prices continue unchanged with the general market of 2.50c, base Pittsburgh, equivalent to 2.82c, Philadelphia, being well maintained. In some exceptional cases 2.40c, Pittsburgh, continues to be done.

Inquiry Getting Stronger

Cleveland, Aug. 7.—Inquiries for tonnages of structural shapes in the past week aggregated a larger total than for some time past. Activity in awards was also increased, the outstanding jobs placed being those of 100 tons for Paul Revere school to Forest City Steel & Iron Co., 250 tons warehouse for Fisher Body Corp. to Burger Iron Co., and 200 tons, Jamestown hotel, Jamestown, N. Y., to Riverside Bridge Co. The outstanding inquiry of the week was that of the Standard Oil Co. of Ohio, in which approximately 1700 tons is involved. The Allerton hotel job, it is reported, will go to the Bethlehem Steel Corp., although not definitely awarded. This work will require 1500 tons of shapes. Another large project brought out for figures is the Detroit Institute of Art, for which several thousand tons of steel will be needed. A more cheerful tone prevails in the market as large buyers who have been holding off for lower prices begin to bring out projects for bids or tentative bids. The mill price of 2.50c, base Pittsburgh, is well maintained as the general market.

League Projects Up

Buffalo, Aug. 7.—The Buffalo Structural Steel Co., is low bidder for 1000 tons needed in the Niagara hotel job at Niagara Falls, N. Y. It is generally understood that nothing definite will be undertaken in regard to the new General Electric plant in the near future. This was to require 1400 tons of steel.

Better Tone Being Sounded

Pittsburgh, Aug. 7.—Improvement in the general tone of the structural shape market is noted by various fabricators here. Awards still are few and far between as far as the local market is concerned although in other sections fairly large tonnages are noted. The American Bridge Co. was awarded this week 1700 tons for transmission tower work in southern Kentucky for the Kentucky Hydro Electric Co. The 450 tons required for the building of the Diamond Alkali Co., Fairport, O. went to an independent fabricator. Steel for the Penn-Harris hotel, Harrisburg, Pa., about 1500 tons, is to be let by a Cleveland general contractor this week and a New York apartment house job, 500 to 1000 tons, is understood to have been let to a Buffalo contractor this week, the Bancroft-Jones Co. The price of plain material is unchanged at 2.50c, base Pittsburgh.

Heavy Work Held Up

Chicago, Aug. 7.—Heavy tonnage jobs in the structural market here are practically all being held up in expectation of better labor conditions. Many important builders have recently signified an intention of waiting for 1924 before progressing with large pending work. Small sizes of shapes nevertheless continue in strong demand from mills and the run of small awards is well up to the average of the past month. The majority of fabricators are well booked for the balance of the year, and prices are reported exceedingly firm at 2.60c, Chicago.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 11,486 tons
Building awards last week..... 8,651 tons
Building awards two weeks ago.... 12,108 tons

1725 tons, building No. 1 General Electric Co., Philadelphia, to Belmont Iron Works.
1700 tons, transmission towers in southern Kentucky for the Kentucky Hydro Electric Co., to the American Bridge Co.
1335 tons, viaduct, Danville, Ill., for Peoria & Eastern railroad, to Fort Pitt Bridge Works.
950 tons, Salaam Temple, Mystic Shrine, Newark, N. J., to Bethlehem Steel Fabricators.
800 tons, building for General Accident, Fire & Life Insurance Co., Philadelphia, to Beltmont Iron Works.
760 tons, column cores for New York Edison Co., Forty-first street and First avenue, to Post & McCord and American Bridge Co.
500 tons, California hotel, Taylor & O'Farrel streets, San Francisco, to Central Iron Works.
500 tons, 8-story building for Press Publishing Co., New York, to Harris Structural Steel Co.
450 tons, stack for Duquesne Light Co., Springfield, Pa., to Pittsburgh-Des Moines Steel Co.
450 tons, building for Diamond Alkali Co., Fairport, O., to an independent fabricator.
350 tons, loft building, Broadway and Twenty-ninth street, New York, to George A. Just Co.
300 tons, factory for Standard Underground Cable Co., Emeryville, Cal., to Herrick Iron Works.
270 tons, four apartments, San Francisco, to Schrader Iron Works.
250 tons, theater at Pittston, Pa., to McClintic-Marshall Co.
250 tons, loading platform and shed, for Fisher Body Corp., Cleveland, to Burger Iron Co.
236 tons, bridge at Scanlon, Minn., to American Bridge Co.
200 tons, government warehouse at Pearl harbor, Honolulu, to Louis R. Smith.
200 tons, Jamestown hotel, Jamestown, N. Y., to Riverside Bridge Co.
200 tons, New York & Queens Gas & Electric Co., Flushing, L. I., to American Bridge Co.
160 tons, warehouse for Fisher Body Corp., Cleveland, to Van Dorn Iron Works.
110 tons, government mine storage building at Pearl harbor, Honolulu, to John Pringle, Burlingame, Cal.
100 tons, Paul Revere school, Cleveland, to Forest City Steel & Iron Co.

STRUCTURAL CONTRACTS PENDING

10,000 tons, 29 tanks for Standard Oil Co. of New Jersey, at Bayway, N. J.; bids asked.
2100 tons, bridge over Ashley river at Charleston, S. C., bids in Aug. 10.
2000 tons, Butler colliery, Pittston, Pa., for Pennsylvania Coal Co., quick bids asked.
1700 tons, boiler house for Standard Oil Co. of Ohio, Cleveland; pending.
1400 tons, Buffalo General Electric Co., Buffalo, N. Y.; temporarily postponed.
1100 tons, annex to Philadelphia Bulletin building; pending.
1000 tons, Niagara Falls hotel, Niagara Falls, N. Y.; Buffalo Structural Steel Co., low bidder.
1000 tons, apartment house, New York; general contract awarded to Bancroft-Jones Co., Buffalo.
1000 tons for state capitol building, Seattle, Wash., all bids rejected.
800 tons, fourth section of Standard Oil Co. building, Broadway, New York, bids in.
640 tons, addition to the Penn-Harris hotel, Harrisburg, Pa.; Hunkin-Conkey Construction Co., Cleveland, general contractor, to let steel this week.
600 tons, cast steel cables for Delaware river bridge; bids in Aug. 15.
500 tons, apartment building Park avenue, New York, to Post & McCord Steel not yet placed.
500 to 600 tons, county home, Wende county, New York; bids in Sept. 1.
350 tons, several small bridges, for Baltimore & Ohio railroad; bids asked.
200 tons, plaster mill, Grand Rapids, Mich.; bids being taken.
200 tons, mill building for Cleveland Stone Co., Amherst, O.; pending.
150 tons, store building, Detroit avenue and Warren road, Lakewood, O.; Hunkin-Conkey Construction Co., general contractor.
Tonnage not stated, assembling plant for Ford Motor Co., Philadelphia; pending.
Tonnage not stated, Detroit Institute of Art, Detroit; bids in Aug. 23.

List Results of Auction at Boston Navy Yard

Washington, Aug. 7.—The central sales office of the navy department has announced the following sales resulting from the auction of surplus navy department material at the Boston navy yard on July 26, with prices per 100 pounds:

Philadelphia Iron & Steel Co., Philadelphia, 30,000 pounds steel bars, extra soft, at $1.60.

New England Bolt Co., Everett, Mass.; 2,983,669 pounds wrought iron bars, grade A, at $1.60; 476,000 pounds steel bars, medium black, at $1.50.

Midgley Steel Products Co., New York.; 506,729 pounds medium steel bars, for chain studs, at $1.40; 51,225 pounds structural I-beams, at $1.62½.

J. Lipsitz, Chelsea, Mass.; 239,367 pounds medium black steel bars, at

$1.22½; 91,251 pounds medium black steel channels at $1.32½; 32,000 pounds half-round solid steel bars at $0.70.

Calcos Iron & Steel Co., Philadelphia; 134,000 pounds semifinished steel slabs at $1.60.

Hyman-Michaels Co., Chicago; 1,376,531 pounds hull steel plates, medium black, at $1.25; 185,701 pounds steel boiler plates, class A, at $1.27½.

J. Sussman, Tacoma, Wash.; 86,327 pounds steel ribbed floor plates, type A, at $2.85.

Max Cohen, Chelsea, Mass.; 442,765 pounds steel angles, medium black, at $1.30; 65,180 pounds high tensile steel angles, black, at $1.35.

Joseph Lewis, Boston; 464,227 pounds extra soft steel slabs, at $1.65; 56,000 pounds heat-treated steel bars, at $1.35; 52,334 pounds black, soft steel billets at $1.80.

Mark Angel, Boston; 232,023 pounds galvanized steel sheets at $205.

Plan Enameling Plant

Erection of a factory containing 70,000 square feet of floor space is planned by the Enamel Products Co., Norwalk, O., which recently was incorporated with an authorized capitalization of $500,000. The plant, which will be devoted to the manufacturing of vitreous enamel products, will be equipped with six furnaces, and the company will be in the market for building materials and complete equipment for the plant. Officers of the company, which is maintaining temporary offices at 214 and 215 Citizens National Bank building, Norwalk, are: President, F. W. Cook; vice president Thomas F. Adkins; secretary, Frank Dudley and treasurer, E. W. Taylor. The board of directors includes the officers and Robert Roadhouse, Des Plans, Ill., Dr. M. A. Mason, Ft. Wayne, Ind., and H. G. McKnight.

While the charter of the company has been issued the sale of stock has not as yet been certified by the state, but this is expected to be done no later than Aug. 8.

Iron Ore Imports Drop

Philadelphia, Aug. 7.—Imports at this port in the week ending Aug. 4 included 2004 tons of chrome ore from British India, 19,822 tons of iron ore from Sweden, 3770 tons from Newfoundland and 7500 tons from Cuba, while 122 tons of scrap steel came from England.

Car Loadings Break Record

Washington, Aug. 7.—By loading 1,041,044 carloads of freight in the week ended July 28, the railroads again broke all records, the figure topping by 13,000 car loadings in the preceding week, which was the high mark to date. The record was broken despite a slight recession of coke and ore loading. American Railway association officials believe 1,200,000 cars weekly will be loaded this fall before the winter slump begins.

Daniel J. Danaher, a Meriden, Conn., lawyer, has been appointed temporary receiver for the Griswold, Richmond & Glock Co., Meriden and Hartford, Conn., maker of sheet metal.

Rail Inquiries Increase

Mills Unprepared to Quote on 1924 Business—Oregon Short Line to Build 98 Mile Addition—Car Buying at Minimum

RAILROAD TRACK MATERIAL PRICES, PAGE 355

New York, Aug. 7.—Except for the inquiry of the Canadian National railways for 1000 box cars of 40-ton capacity recently issued, bids on which will be received Aug. 9, little business is in sight in the car building department. Railroads continue active buyers of steel for repair work and are seeking delivery on their contracts.

The Lehigh & New England railroad has placed 2000 tons of rails with an eastern maker.

Buying of freight cars in July was the lightest this year, approximately 1450 cars being placed. This decrease applies also to passenger cars and locomotives, orders being small and scattered. Following is a comparative statement:

July	1,450
June	1,785
May	2,200
April	9,800
March	42,499
February	9,300
January, 1923	15,000
December	23,255
November	18,500
October	12,700
September	10,350
August	1,610
July	13,700
June	13,100
May	18,250
April	31,500
March	12,000
February	14,500
January, 1922	11,000
1922 total	180,465

Railroad Buying Still Heavy

Chicago, Aug. 7.—Railroad buying continues to occupy the limelight in the finished steel market of the West. The Canadian Pacific recently has been a heavy buyer for material for repairing cars. This company will build 1400 box cars and 300 automobile cars in its own shops. New car orders have been few, but contracts for the repair of cars are numerous. The New York Central has placed a contract for 500 hopper cars, and is in the market for material for 500 additional cars. The Southern railroad purchased 1000 center sills. A western road has inquired for 10,000 tons of rails for 1924 delivery, and the Norfolk & Western is understood to be in the market for 50,000 tons of rails for this same delivery. As yet mills are unprepared to quote for delivery beyond Jan. 1. The Southern railroad bought 10,000 tons of tie plates during the week. Another road bought 2000 tons of angle bars. The Chicago, Burlington & Quincy is in the market for a heavy tonnage of miscellaneous track material. Much interest attaches to the new construction authorized for the Oregon Short Line. This railroad will build 98 miles of standard gage track from Rogerson, Idaho, to Wells, Nev., at an estimated cost of $5,000,000. Deliveries of railroad material are still far behind.

Rail Requests More Numerous

Pittsburgh, Aug. 7.—Requests for small lots of light rails are becoming slightly more numerous as coal mine trackage is being extended in various fields. Numerous mines are still entirely idle and real buying is not expected until fall. Large tonnages consequently are absent from present negotiations, the majority of orders comprising single carloads. Occasionally a larger tonnage is specified by an interest with several different operations.

While for some weeks past most of the spike business transacted has been confined to standard spikes at 3.15c, base Pittsburgh, this past week some small spike inquiries developed, particularly from coal mining supply houses. This is encouraging to makers of such material since of late small spike orders have been scarce. The American Steel & Wire Co. continues to quote 3.50c on small spikes but manufacturers of these from hot rolled bars are maintaining the 3.75c level. This same spread, 3.50c to 3.75c, applies on boat and barge spikes. Tie plates are in fair demand at a minimum of 2.60c. Standard track bolt shipments are large although new orders are somewhat slow in materializing. Small track bolt orders partake of the same general character that applies in connection with all products used in the coal mining industry. Track bolts are quoted at 4.00c to 5.50c, base Pittsburgh.

Cotton Belt Large Buyer

St. Louis, Aug. 6.—Daniel Uptegrove, president of the Cotton Belt railroad, has announced that the total improvement program of the road for 1923 calls for an expenditure of more than $7,000,000. Of this amount $2,783,000 is for 1200 steel underframe freight cars, $750,000 for 15 consolidation type oil burning freight locomotives, $800,000 for new tracks and heavier rails, $600,000 for ballasting and $690,000 for new bridges.

CAR ORDERS PLACED

Pere Marquette railroad, 500 refrigerator car underframes; maker not announced.

Connecticut Co., 50 trolley cars, to The Osgood Bradley Car Co.

Honor Late President

New York, Aug. 7.—The United States Steel Corp. will close its offices on Aug. 10, in so far as practicable. However, because it will not be practicaale, plants will be continued in operation, and mill hands will continue at work except for short designated periods. This action was decided upon as a mark of respect for the late President Harding, whose burial at Marion, O., takes place that day.

Approve Steel & Tube Sale

New York, Aug. 7.—Stockholders of the Steel & Tube Co. of America at a meeting at Wilmington, Del., today approved the recent sale of the company to the Youngstown Sheet & Tube Co. and arranged for a distribution of the proceeds of the sale.

The Nonferrous Metals

Zinc and Lead Get Fair Business but Copper Dull Except for One Big Sale at Low Price

	Copper—Electro delivered	Copper—Lake delivered	Spot Straits New York	Lead† New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
Aug. 1.....	14.50	14.75	38.37½	6.75	6.25	26.00	7.75	29.00
Aug. 2.....	14.42½	14.75	38.12½	6.75	6.20	26.00	7.75	29.00
Aug. 3.....	14.42½	14.75	38.00	6.75	6.17½	26.00	7.75	29.00
Aug. 6.....	14.37½	14.75	38.12½	6.75	6.15	26.00	7.75	29.00
Aug. 7.....	14.37½	14.62½	38.37½	6.75	6.15	26.00	7.75	29.00

†Outside market quotation.

NEW YORK, Aug. 7.—Little activity has been noted in the nonferrous metal markets the past week. Selling pressure has not been pronounced in any line; on the other hand, buyers have continued to limit purchases to bare requirements as established by orders for their own products and in most cases the volume of new business has been well below the peak rate of earlier in the year.

The death of President Harding resulted in virtual suspension of business in metals in New York on Friday. Monday was a bank holiday in London, so that the usual flow of influences between the two main world markets was interrupted most of the past week. The progress of the negotiations between Great Britain and the other allies on the reparations question has continued a leading factor in the metal markets, pending the outcome of which there is not much inclination to make important commitments in any direction.

The outstanding feature of the copper market the past week was the placing of an order for 5,000,000 pounds of copper by the Western Union Telegraph Co. at a price said to be around 14.37½c, delivered, which compared with a previously quoted market of 14.50c. There was considerable competition for this business and its placing definitely established the market on a 14.37½c delivered basis, though some agencies have not officially declined to this level. General business in copper, both foreign and domestic, has been slow. Producers have been busy shipping copper on old orders and fabricators have been doing the same, while new business booked by both general branches of the industry has been much less than shipments. In the course of a month to six weeks the outlook is for a change in the statistical position, unless new buying of fabricated products takes definite improvement. Casting declined to 14.12½c, refinery.

Zinc prices have declined gradually from 6.30c to 6.15c, East St. Louis, without any marked selling pressure, merely following the London market. The recent improvement in London did not result in any export sales, so far as known, but the British consumption of zinc has gained and galvanizers abroad have done some good buying. Continental offerings of zinc in Great Britain have been small. It is rather expected some export demand for American zinc may be experienced before the end of the year. Brass special zinc has commanded 15 to 20 points over prime western.

Lead has been fair, and in good demand. Speculators have continued in the market, but producers have had little lead to sell and no difficulty has been experienced in obtaining a premium of ¼ cent in the outside market over the leading interest's price of 6.50c New York. Sales have been made almost every day on the basis of 6.75c, New York. At East St. Louis the price is 6.55c though it was up to 6.60c.

Some good consuming business was done in tin a week ago, but subsequently the market quieted down. The July 31 statistics showed another decrease in the world visible supplies, but London failed to work up enthusiasm based on the statistics. Prices here have ranged between 38c and 39c for Straits tin.

Antimony has been less active following the recent speculative flurry, with prices ranging between 7.62½ and 7.75c, duty paid, for spot.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 24 oz., min.	23.75
High brass	19.75
Zinc, ga. 9 to 18 (plates ½c less)	8.90
Lead, full sheets (cut ¼c more)	9.75
Aluminum, base 18 ga. and up...	35.40
SEAMLESS TUBES	
High brass	25.50
Copper	27.00
RODS	
High brass, round, ⅝ to 2½ inch	18.00
Naval brass rod	20.25
WIRE	
Copper	17.00 to 17.25
High brass	20.25

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	8.00 to 9.00
New York	9.25 to 9.50
Chicago	9.50
HEAVY YELLOW BRASS	
New York	6.50 to 7.00
Chicago	7.25 to 7.50
Cleveland	6.00 to 6.50
ZINC	
New York	4.25
Cleveland	3.00 to 3.25
HEAVY COPPER AND WIRE	
Cleveland	11.00 to 11.50
New York	11.50 to 12.00
Chicago	11.50
RED BRASS TURNINGS	
New York	8.75 to 9.00
Cleveland	8.00 to 8.50
Chicago	8.00
YELLOW BRASS TUBING	
Cleveland	6.00 to 6.50
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.00 to 6.50
New York	6.75 to 7.00
Chicago	7.00 to 7.25
ALUMINUM BORINGS	
Cleveland	10.00 to 11.00

Auto Body Plant for Dodge Bros. Near Completion

Detroit, Aug. 7.—Dodge Bros. are about to enter upon large operations for the making of automobile bodies in Detroit as the result of completion of its new buildings which will give the plant about 750,000 feet additional floor space. All bodies for Dodge cars heretofore have been manufactured in Philadelphia. The company is completing one building 1000 feet long and six stories high that will be used as a new body plant. In the structure 400 tons of structural steel was used, 1464 tons of reinforced steel and 30,000 barrels of cement. It cost in excess of $1,000,000.

An announcement is made at Lansing, Mich., that the Oldsmobile Co., is about ready to place orders for 750 new machines including drill presses, lathes, etc.

Operation of Sheet Mills in Valley Declines

Youngstown, O., Aug. 7.—Since the third week in July sheet mill operations have decreased gradually from 82 per cent to 66 per cent. While the decline has been due to business conditions to some extent yet a shortage of mill crews has tended to keep mills inactive. This week 79 of 120 sheet mills in this district are under power. The Newton Steel Co., is operating 17 of 20 units, the Youngstown Sheet & Tube Co., 22 of 42 units, Republic Iron & Steel Co., 8 of 18, the Mahoning Valley Steel Co., 7 of 8, the Sharon Steel Hoop Co., 4 of 9 and the Trumbull Steel Co., 15 units.

Independent open hearths are operating at 84 per cent, the same rate as a week ago. The Youngstown Sheet & Tube Co., is charging 19 open hearths, the Republic Iron & Steel Co., 12, and the Trumbull Steel Co., and the Sharon Steel Hoop Co., 6 each or 43 of 51 district units.

Miscellaneous finishing mill operations are unchanged. At the Youngstown Sheet & Tube Co.'s plants 2 bar, 4 plate and 11 pipe mills and its rod, wire and bessemer departments are engaged. The Republic Iron & Steel Co., has 8 finishing and 6 pipe mills active together with its bessemer department. The Trumbull Steel Co., reports 23 hot tin mills and all strip mills active. At the Canton, O. works of the Falcon Steel Co., 7 hot tin mills are scheduled.

Report Russian Output

Washington, Aug. 7.—The department of commerce gives Russian production of manganese ore in the six months ended with March, 1923, as 42,747 gross tons and stocks on hand April 1 as 56,915 tons. In the same six months production of iron ore is placed at 150,670 tons and the April 1 stockpiles at 2,265,083 tons. Russian pig iron production for the first quarter is estimated at 141,400 gross tons, of open-hearth steel at 228,560 tons, and of rolled material at 176,850 tons.

To Receive Medals for Metallurgical Work

ANNOUNCEMENT is made by the board of awards of the American Foundrymen's association that Enrique Touceda and John Howe Hall have been chosen as the first recipients of the John A. Penton and J. H. Whiting gold medals respectively. The presentation of these medals will be made at a special session of the 1924 annual meeting of the association.

According to the announcement, Mr. Touceda, who is to receive the John A. Penton medal, was selected because of his outstanding scientific achievements in connection with the development of the American malleable casting industry. The J. H. Whiting medal is to be awarded to Mr. Hall in recognition of his valuable metallurgical work relating to the manufacture of steel castings.

The awards were made possible by the establishment of four funds of $5000 each donated to the association by four past-officers, namely past-presidents W. H. McFadden and J. S. Seaman, past vice president. J. H. Whiting, and the association's first secretary, John A. Penton. The administering of the funds has been placed in the hands of an award board consisting of the last seven living past-presidents of the association.

The board also announces that plans for the awarding of the W. H. McFadden medal have been completed. It has been decided that if at the 1924 convention a paper of outstanding merit is presented, it shall be recognized by conferring upon the author the McFadden medal, presentation to be made at the 1925 convention. It is expected that the Joseph S. Seaman medal also will be presented at the 1925 convention, but the board of awards is not yet prepared to make any announcement regarding the awarding of this medal.

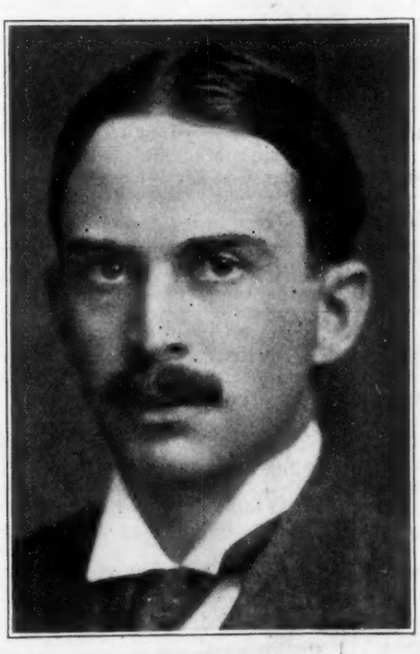
The recipients of the John A. Penton and J. H. Whiting medals are well-known for their work in the foundry industry. Enrique Touceda is consulting metallurgical engineer and professor of metallurgy at Rensselaer Polytechnic institute and since 1912 has been consulting engineer for the American Malleable Castings association. In the latter capacity he has been largely instrumental in standardizing the processes and analyses in the production of malleable. Through Prof. Touceda's efforts the quality of malleable castings has been steadily improving.

Prof. Touceda is a member of the American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, Society of Automotive Engineers, American Society for Testing Materials, American Iron and Steel institute, Iron and Steel institute. (British), American Society for Steel Treating, American American Chemical society, and is an honorary member of the Institute of British Foundrymen. Last year he delivered the exchange paper for the American Foundrymen's association at Birmingham, England.

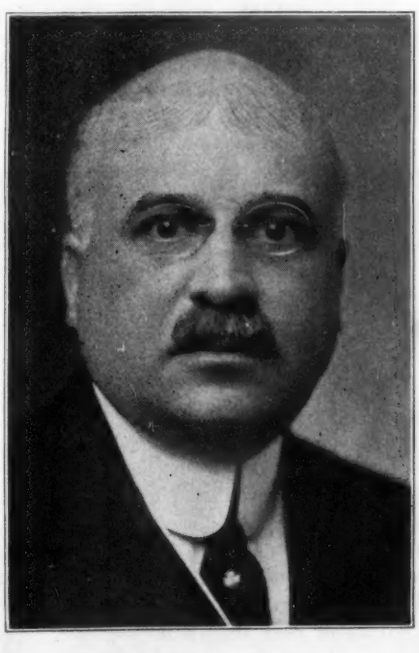
John Howe Hall, to be first recipient of the J. H. Whiting medal, has been chosen because of his achievements in metallurgy in the steel casting industry. Among his metallurgical achievements were the development of special manganese steels and the development of a method for melting ferromanganese in the cupola instead of by the more expensive method of crucible melting. The manufacture of manganese steels in electric furnaces and the development of special heat-treating processes are further achievements of Mr. Hall in the steel casting industry.

Mr. Hall is the author of "The Steel Foundry," a treatise on steel foundry practice, and also of the chapters on crucible and bessemer steel in the "A.B.C. of Iron and Steel."

Furthermore he has contributed numerous papers before meetings of the American Foundrymen's association, the Institute of Mining and Metallurgical Engineers, the Society of the Chemical Industry, the American Society of Mechanical Engineers and other technical organizations. His articles also have appeared in many trade and technical publications devoted to the iron, steel and metal-working industries.



JOHN HOWE HALL



ENRIQUE TOUCEDA

Pig Iron Output Holds Up Well

Production of 3,684,631 Tons in July Exceeds That of June by 16,000 Tons—Average Daily Rate, However, Is Reduced—26 Stacks Blown Out or Banked, Leaving 299 Active July 31

IN SPITE of the fact that 26 blast furnaces were banked or blown out during July production of coke pig iron was well maintained. Complete reports from all blast furnaces in the country show a production of 3,684,631 gross tons and an average daily rate of 118,859 tons. The total production exceeded that of June but this was due to the fact that July had 31 working days as compared with 30 in June. The daily rate of production was about 3500 tons below that of June. On the last day of the month 299 furnaces were operating as compared with 322 on June 30. This reduction was anticipated, as for several weeks a slowing down in activity has been noted. It is interesting to find, however, that the majority of the furnaces made inactive were banked rather than blown out, indicating that an early resumption may be expected.

MONTHLY PRODUCTION

	1923	1922	1921
January	3,228,226	1,645,804	2,414,753
February	2,993,918	1,630,180	1,929,394
March	3,523,595	2,035,908	1,594,866
April	3,546,308	2,070,161	1,190,751
May	3,868,486	2,309,348	1,215,272
June	3,667,868	2,362,455	1,064,007
Total 1st half	20,828,401	12,053,856	9,409,043
July	3,684,631	2,403,030	864,642
August	.....	1,810,665	954,901
September	.....	2,024,008	985,795
October	.....	2,629,655	1,234,450
November	.....	2,846,110	1,414,958
December	.....	3,083,520	1,642,775
Total 2nd half	.....	14,796,988	7,097,521
Grand total	24,513,032	26,850,844	16,506,564

Compared with the 3,667,868 tons of iron produced in June the output of 3,684,631 tons in July was a gain of 16,763 tons. This production therefore stands as second to the 3,868,486 tons of May, which was the highest on record. On a daily basis the output for July was 118,859 tons which compared with the 122,262 tons per day of June was a loss of 3403 tons per day.

Merchant iron produced in July totaled 900,496 tons and made a gain of 1394 tons over the 899,102 tons of the preceding month. Reduced to a daily basis the July output was 29,048 tons per day, a drop of 922 tons from the 29,970 tons of June. Nonmerchant pig iron aggregated 2,784,135 tons, as against 2,768,766 tons in June, a loss of 15,369 tons. On a daily basis the July production represented 89,811 tons per day, this figure being a loss of 2481 tons from the 92,292 tons per day of June. These figures indicate that practically all of the loss in production in July was nonmerchant.

Blast furnaces active on the last day of the month totaled 299, this being a loss of 23 from the 322 active on the last day of June. This is the lowest number of active stacks since March, 1923 when 295 were in operation. During the month three merchant furnaces were blown in and 11 blown out or banked, the net loss being eight stacks. Of the nonmerchant class no furnaces were blown in and 15 were blown out or banked. Of the total number of furnaces operating on the last day of the month 97 were merchant and 202 were nonmerchant. The corresponding figures for June were 105 and 217. On July 31 the Steel corporation was operating 106 furnaces as compared with 114 on June 30 and 115 on May 31.

AVERAGE DAILY PRODUCTION

	1923	1922	1921	1920	1919
Jan.	104,136	53,090	77,895	97,172	106,654
Feb.	106,925	58,220	68,906	102,904	105,120
March	113,664	65,674	51,447	108,895	99,614
April	118,210	69,005	39,691	91,754	82,479
May	124,790	74,495	39,202	96,510	67,991
June	122,262	78,748	35,466	101,533	70,467
July	118,859	77,517	27,892	98,190	78,200
Aug.	.....	58,408	30,802	101,468	88,453
Sept.	.....	67,466	32,859	104,143	82,692
Oct	.....	84,827	39,821	106,075	60,142
Nov.	.....	94,870	47,165	97,836	80,204
Dec.	.....	99,468	52,992	87,105	84,711
Ave.	115,627	73,563	45,223	99,456	83,910

Production of spiegeleisen in July was 12,876 tons and a loss of 5308 tons from the 18,184 tons of June. Ferromanganese, however, with a total of 26,493 tons was the highest since December, 1920 when 28,111 tons was made. Compared with the June production of 19,717 tons the July output gaining 6776 tons.

Stacks blown in during the month were: In Tennessee: Standard, Bon Air Coal & Iron Corp. In Virginia: Buena Vista, Alleghany Ore & Iron Co. and Lynchburg, E. J. Lavino & Co.

Stacks blown out during July were: In Ohio: River No. 4, McKinney Steel Co.; Hamilton, Hamilton Furnace Co.; Ironton, Marting Iron & Steel Co.; Milton, Milton Iron Co.; Star, Star Furnace Co.; Youngstown D, Youngstown Sheet & Tube Co.; Niles, Carnegie Steel Co. In Pennsylvania: Fannie, M. A. Hanna Co.; Bethlehem C, Bethlehem Steel Co.; Aliquippa No. 1, Jones & Laughlin Steel Corp.; Shenango No. 3 Shenango Furnace Co.; One Lucy, Edith, one Isabella, New Castle No. 4, and Sharon, Carnegie Steel Co. In New Jersey: Wharton B, Replogle Steel Co. In Illinois: South Works New No. 5 and Joliet No. 1, Illinois Steel Co. In Colorado: Two Minnequa, Colorado Fuel & Iron Co. In Alabama: Bessemer No. 2, Tennessee Coal, Iron & Railroad Co. In Tennessee: Rockdale, J. J. Gray Jr.; Allens Creek, Bon Air Coal & Iron Corp. In Virginia: Max Meadows, Virginia Iron, Coal & Coke Co. In Wisconsin: Mayville, Youngstown Sheet & Tube Co.

DIVISIONS OF PRODUCTION

1922	Merchant	Non-merchant	Spiegel	Ferromanganese	Other ferro
Jan.	388,322	1,257,482	1,230	5,644	825
Feb.	355,455	1,274,725	4,930	3,618	872
March	390,643	1,645,265	2,095	11,604	1,102
April	375,814	1,694,347	4,211	14,998	828
May	410,404	1,898,944	4,902	15,432	405
June	423,672	1,938,783	4,817	18,254	854
July	441,752	1,961,278	7,176	18,873	1,887
Aug.	343,522	1,467,143	7,925	11,402	976
Sept.	353,604	1,670,404	4,235	10,681	934
Oct.	502,231	2,127,424	12,285	9,193	1,080
Nov.	603,348	2,242,762	4,192	13,232	961
Dec.	668,950	2,414,570	10,591	17,108	989
Total	5,257,717	21,593,127	68,589	150,039	11,713
1923					
Jan.	713,186	2,515,040	12,056	19,358	952
Feb.	708,901	2,285,017	3,657	21,410	759
March	767,219	2,756,376	13,832	20,730	236
April	795,558	2,750,750	7,440	20,810	670
May	909,726	2,958,760	9,533	19,568	892
June	899,102	2,768,766	18,184	19,717	874
July	900,496	2,784,135	12,876	26,493	776

JULY PIG IRON

	No. of stacks	No. in blast last day of month July	June	Total tonnage made Merchant	Nonmerchant	Totals July	Totals June
Pennsylvania	150	116	125	233,518	1,121,285	1,354,803	1,345,110
Ohio	79	60	67	186,887	645,850	832,737	845,211
Alabama	42	27	28	137,341	100,664	238,005	236,648
Virginia	19	6	5	29,167	.....	29,167	25,017
New York	27	24	24	118,741	143,044	261,785	250,690
New Jersey	4	2	3	19,381	.....	19,381	26,033
Illinois	26	22	24	81,300	291,029	372,329	362,282
Colorado	5	1	3				
Indiana	16	16	16	35,000	327,685	362,685	368,300
Maryland	6	5	5				
Wisconsin	6	3	4				
Kentucky	7	2	2				
West Virginia	5	4	4	15,280	65,894	81,174	82,111
Tennessee	14	4	5				
Washington	1	0	0				
Georgia	2	0	0				
Texas	1	0	0				
Minnesota	3	3	3	32,006	60,414	92,420	87,691
Michigan	4	4	4				
Missouri	1	0	0				
Spiegel and ferro—all states	...	...	...	11,875	28,270	40,145	38,775
Totals	418	299	322	900,496	2,784,135	3,684,631	3,667,863

British Pig Iron Sold in East

Pennsylvania Pipemaker Takes 6000 Tons at $22.85 f. o. b.—British Steel Prices Firmer—Ferromanganese Reduced—Industry in Ruhr Almost at Standstill—285,000 Applications for Export Permits

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Aug. 7.—An eastern Pennsylvania cast-iron pipe manufacturer has purchased 6000 tons of English foundry pipe (2.50 per cent silicon) at £5 ($22.85) f.o.b., the freight being 14 shillings ($3.19). Further American buying is discouraged by the weakness of the market in the United States.

The iron and steel industry in the Ruhr has been brought almost to a standstill in pursuance of the French policy as announced in the recent note to Great Britain, stating France's purpose to bring about such hindrance to the economic organization in Germany as will compel Germany to agree to the French demands regarding security for reparations. Only 11 blast furnace stacks in the Ruhr are operating, the daily output being scarcely 2000 tons. In January the number of active stacks was 74. Applications have been made by foreign buyers for a total of 285,000 permits to export steel from the Ruhr, and to date only 30,000 have been granted. The French authorities intimate that restriction will be increased in the future. Meanwhile business in the unoccupied districts of Germany has improved, although handicapped by the rapidly disappearing value of the mark. The correspondent of IRON TRADE REVIEW at Dusseldorf reports that the following prices are now prevailing: Pig iron 6,825,000 marks per ton; coke, 3,044,000 marks; billets, 12,960,000 marks; bars and shapes, 18,750,000; plates, 21,131,000 and sheets 31,257,000 marks. Attempts to regulate prices according to exchange values have failed. The correspondent says there is danger of riots increasing in severity owing to unsatisfactory distribution of food.

In the British market sheets continue active. Steel prices generally are firmer though the pig iron market still is weak. Ferromanganese for export has been reduced 30 shillings ($6.84) to £18 10s ($84.54).

Changes in prices in the British market this week bring the following products to the levels as quoted: Galvanized sheets £18 15s ($85.69); East and West coast hematite, Middlesbrough basic and Middlesbrough No. 3 foundry iron £5 ($22.85); Derbyshire No. 3 foundry iron £4 15s ($21.71); Scotch No. 3 foundry iron £5 5s ($23.99); ferromanganese for export £18 10s ($84.55); English plates for home use £9 5s ($42.27); English plates for export £9 ($41.13); Scotch plates for home use and export £9 ($41.13); black sheets for home use £12 10s ($57.12); black sheets for export £12 ($54.84).

Sterling exchange is figured on a basis of $4.57.

Continued Price Cuts Fail To Increase Buying

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

BIRMINGHAM, England, July 27.—All the iron and steel markets have further weakened. At the quarterly meetings there was a complete absence of the usual contracts for supplies. Users of pig iron are content to take small parcels in the expectation of lower prices. Quotations on the leading brands of pig iron have been reduced. Cleveland No. 3 G. M. B. is £5 7s 6d ($24.76); east coast hematite £5 5s ($24.09); west coast hematite £6 2s 6d ($28.11) delivered Sheffield, which is about 2 shillings 6 pence ($0.57) below last week's price. Representative Midland irons are cheaper, Northamptonshire being quoted at £4 17s 6d ($22.37) with North Staffordshire at about the same price. The nominal figure of £5 ($22.95) for Derbyshire could be shaded.

Drastic reduction of output has been restricted so far to the Barrow area, where within a month the furnaces in blast have been reduced from 18 to 13.

Sterling—$4.59

Stocks in that area have reached a total of 50,000 tons, which far exceeds the tonnage in any normal prewar year. A certain amount of stocking is going on in the Cleveland area and the difficulties of makers there are increased by the recent advances in ironworkers' and miners' wages. The market is decidedly weak for hematite. There is some talk of damping down furnaces, but it is hoped that no further steps in that direction will be called for.

Exports from Middlesbrough are rather small, Germany for the time being taking the largest quantity. Now that continental prices have shown a rising tendency the position is considered rather more hopeful. There are signs of renewed buying from the continent, one inquiry for several hundred tons having reached a Northampton furnace. The makers are not very hopeful of getting the business as they are handicapped by a rail charge of about 15 shillings ($3.44) to the port.

The coke position is somewhat obscure, largely on account of the effect of the dock strike. A lot of coke has been held up at the ports, and the cokemakers have been a little more disposed to seek home business. In the Midlands furnace coke has been reduced from £1 10s ($6.88) to £1 6s ($5.96), ovens. In the Middlesbrough area the furnacemen complain that Durham coke still costs them about £2 ($9.18) by the time it reaches the furnaces. The reduction of output on the West Coast also has brought down coke, but makers complain of a continuing charge of £2 8s ($11.01) for fuel by the time it reaches the furnaces. Rubio ore continues at £1 4s ($10.09) per ton c.i.f. Tees, though this is a nominal figure.

In the finished and semifinished departments, conditions have changed somewhat, through the rise in continental values. The rise of prices in France and Belgium, have been reflected in

(*Continued on Page* 400)

President Harding always had a cheerful, friendly greeting for those who called on him. A mine safety crew that won recognition for special expertness found the President particularly cordial

Industry Mourns Harding's Death

President Was Regarded as Strong Influence for Peace and Prosperity—Differed with Large Employers on Immigration Issue—Last Efforts in Behalf of Employes — Coolidge Will Carry On

BY E. C. BOEHRINGER

Washington Correspondent, Iron Trade Review

WASHINGTON, Aug. 7.—From iron and steel and general industry the death of Warren G. Harding calls forth more than the conventional though sincere and universally-shared grief over the passing of a President. The tragedy of San Francisco has cost industry almost a personal representative in the White House; it has taken from many iron and steel and manufacturing executives a loved friend, a friend so genuine he could differ, because he deemed himself right, on two major items of policy without cooling the warmth for him. No industry has been so close to the late President as iron and steel and hence his passing, as was that of the martyred McKinley, is the more keenly felt.

The popular and hurried assessment of the Presidency is that it deals almost wholly with matters of state and politics and that business is a subordinate concomitant, yet a review of the Harding administration reveals a preponderance of gestures for the betterment and advance of business and industry. It discloses that the late President, with unerring instinct, adjudged that as business was successful or depressed during his ministration of the federal government, so would he be a help or a hindrance to the body politic and so would his regime be appraised in history.

The uncommon good sense of Mr. Harding first displayed itself in the selection of Charles E. Hughes as secretary of state, Andrew W. Mellon as secretary of the treasury and Herbert Hoover as secretary of commerce. Thus he won the confidence of the business and industrial community and began to stem the outgoing tide of business surging about him as he entered the White House in March, 1921. This triumverate guided and served the late President through tortuous channels. The calling of Mr. Hoover to the cabinet probably won Mr. Harding a greater measure of support from the business community than any other single act. Many of Mr. Harding's industrial policies were reflections of Mr. Hoover's acute and far-sensing mind, and it is to the credit of the President that he courted counsel and refused to cloak himself in a fog of omniscience. Nothing so well illustrates President Harding's business turn of mind and his appreciation of business standards than his appointment of Gen. Charles G. Dawes as commissioner of the budget and his strong support of the movement to conserve and reduce the cost of government administration.

The point of closest contact between the late President and the iron and steel industry was the matter of the elimination of the 12-hour day and by coincidence, it was on the eve of the very day upon which Mr. Harding breathed his last that the directors of the American Iron and Steel institute pledged the entire industry to the speedy abolition of the 12-hour day. At the suggestion of Mr. Hoover, who wished to tie the adminstration and business a little more closely, the President dined the leading men of the industry at the White House in the spring of 1922, and informed them the termination of the long day would please him mightily and prove an outstanding accomplishment. So late

as July 5, at Tacoma, Wash., the late President stated: "I should be proud indeed if my administration were marked by the final passing of the 12-hour working day in American life." The leaders of the industry were no less cognizant of the desirability of the universal adoption of the shorter day than was the President, but he stirred them into action.

Upon the subject of immigration, too, the minds of the leading iron and steel officials and the late President did not run parallel. It was in 1921 that the 3 per cent immigration act, after years of discussion over putting the lid on the melting pot, became effective. Industry then, as now, regarded the act as prejudicial to its best interests. It was thought that the President through his intimate acquaintanceship with men of industry could be moved to an advocacy of broadening and tempering the act, but the counsels of Secretaries Hoover and Davis prevailed. Like them, he began to view immigration in the light of a social and not an economic problem, and more than once voiced the belief that the industry itself would be most endangered by an unchecked inflow of incendiary aliens.

The unemployment situation which became more threatening in the summer of 1921 Mr. Harding turned over to Mr. Hoover for amelioration. Mr. Hoover rightly adjudged the situation a psychological one, convened a conference of the best minds in Washington in the fall, and speedily checked the discontent. It is probable that the conference spared the United States the unhappy and degrading experience of the British unemployment dole. Out of the conference, too, has grown the study of the business cycle. In the same direction may be cited Mr. Hoover's effort for standardization and simplification of commodities, which is making for greatly-increased efficiency and lowered production costs.

Appoints Coal Commission

The federal coal fact-finding commission now at work is partially the late President's reaction to the great coal strike of 1922. He was hopeful that the investigations of the commision would point the way to a permanent solution of the country's fuel problems. Nothing was closer to Mr. Harding's heart than the upbuilding of a merchant marine and he believed that by putting and maintaining the American flag on the high seas he would be creating an efficient international delivery service for American industry. Mr. Harding was not in favor of government ownership and operation, but he preferred a federal merchant marine to none at all. His struggle with congress and some of the best minds of his own party over the shipping question revealed his courage. To those who believed Mr. Harding was weak and easily moved by political considerations his vetoing of the soldier's bonus and the increased pension bills was complete refutation.

The railroad problem was another domestic sore spot which the late President had hoped to heal. He was persuaded by Mr. Hoover that the best solution at this time was promised by the grouping of all the railroads of the country into a few great systems. The Cummins-Esch act foreshadowed such merging, but it had no teeth. Had the President lived he doubtless would have urged congress next fall to strengthen the act at least in this particular. The interstate commerce commission's manner of increasing rates on a percentage basis met with his disapproval because it had the effect of constantly widening the mileage between the point of production of raw materials and the point of their consumption. On his western swing, which proved a fatal weight upon his health, Mr. Harding strongly advocated a regrouping of the railroads and warned that the railroad arteries of traffic were indispensable and hence imperatively in need of sympathetic treatment.

Mr. Coolidge's unexpected succession to the Presidency placed at once upon him the decision of continuing the Harding policies or of enunciating his own. Mr. Coolidge's first statement and one he refuses to amplify, with due observance of the proprieties until after the final rites for Mr. Harding at Marion,

Harding, Staunch Friend of Industry

BY C. J. STARK

Editor Iron Trade Review

IN HIS broad Americanism, President Harding always had the best interests at heart of the American iron and steel and related industries because of their importance to the material welfare of the country which he so well appreciated. A strong believer in protection for American industry, he was a close observer and student of foreign affairs which had a direct bearing on business conditions in this country.

It was this constructive interest in and understanding of American industry that caused him to study the possibilities of the inflow of goods from those countries possessing low production costs through cheap labor. He was particularly impressed by the tendency toward industrial development in recent years in China and India, which, combining abundant raw materials with native labor at extraordinarily low cost, he regarded as a possible source of ruinous competition to American manufacturers. His attention had been especially caught by the construction and extension in recent years of blast furnaces and steelworks in India and China under the direction of skilled engineers from other countries. He feared the American iron and steel industry was destined to suffer from a continuing development of this kind.

These were the thoughts of Senator Harding that were given general expression by him during his campaigning days for president. To discuss these and other phases of the needs and of the organization of the iron and steel industry, he called the editor of IRON TRADE REVIEW into conference at Marion on several occasions in the summer and fall of 1920. In these discussions, Senator Harding's inquiry dealt primarily with the question how the American industry was to compete against the rising production of the low-labor countries of the Far East. He apparently believed that high protection was necessary to ward off this menace to the home market.

Happily, the things which Senator Harding feared as a candidate for the presidency with respect to the American iron and steel industry did not prove true on an important scale during his years as President. Nevertheless, some tonnage of Indian pig iron has been brought into this country during the past year particularly on the Atlantic coast and has displaced domestic iron because of its low price. The possibility of ruinous competition from the Far East, therefore, which President Harding feared, has not been finally laid and remains a question to be considered in the framing of future tariff schedules.

PRESIDENT HARDING'S "HUMANNESS" WAS REVEALED ON MANY OCCASIONS. ON VACATION AT POINT ISABEL, TEX., IN NOVEMBER, 1920, HE AND MRS. HARDING RODE IN THE CAB OF THE PASSENGER LOCOMOTIVE, MR. HARDING TAKING THE THROTTLE FOR 21 MILES

O., on Friday, announced that he would adhere both to Mr. Harding's policies and his organization. The wisdom of Mr. Harding in seating the vice president in his cabinet is thus proved. Mr. Coolidge is a man of few words, but of meaningful words. What he states he intends. The members of the cabinet will tender their resignations but they will not be accepted except upon personal urgence.

The attorney general, Mr. Daugherty, was so closely allied to the late President and his health has become so impaired he doubtless will ask to be released. The speculation is that Mr. Hoover and Mr. Hughes will leave only in case they have aspirations for the nomination in 1924. Certainly, nothing definite will develop until after the interment of Mr. Harding.

New President Has Strength

The new President lacks the personal charm of Mr. Harding, but there is a decided belief in Washington that he will prove of unexpected strength. Mr. Coolidge, in a degree like former President Wilson, is little moved by personal considerations and has an exact and an exacting mind. To the country at large Mr. Coolidge is known as the governor of Massachusetts who stood bravely for law and order during the Boston police strike of 1919 and defied organized labor and Mr. Gompers. To the people of Massachusetts he is known as one of the best executives the state ever has had. In many respects Mr. Coolidge gives rise to the belief he is more conservative than his predecessor. There should be no fear that the thirtieth President will prove weak, will bow to the raucous radical-farmer element, or will do anything inimical to the business fabric of the nation.

The new President wrote an advanced labor record during his term of service in the Massachusetts legislature and as governor. He approved such measures as a 48-hour week for women and children, increasing weekly payments under the state compensation act, permitting employes to have representation upon directorates and permitting such cities as desired it to install the platoon system for police and firemen. But his courageous stand, as the public viewed it, in declaring that the first duty of Boston policemen was to the city and not the union won for him a still unceasing enmity of organized labor. Mr. Coolidge cannot be termed anti-labor by any means, but it is believed he would take a firmer stand than Mr. Harding ever did in case of a great national strike. The nomination for the vice presidency came to Mr. Coolidge in 1920 through the fame from his strike stand, and his elevation to the Presidency is proof positive of the sure reward for a righteous and fearless stand.

Should Favor Merchant Marine

Mr. Coolidge's New England mind may give some insight into his future actions. He has seen that region suffer severely from the coal strikes of recent years and from the breakdown of transportation, partially due to financial manipulation and partially to natural causes. Mr. Coolidge was chairman of the railroad committee of the state senate for one term. By temperament he should be strongly in favor of a merchant marine. On international matters he is likely to urge the cause of the world court, which was so close to Mr. Harding's heart. If anything, Mr. Coolidge is more of an internationalist than Mr. Harding was.

The radical-farmer element in congress as led by the LaFollette-Brookhart-Johnson group doubtless will seek to grasp the leadership both of the Republican party and the coming session

ONE OF THE LAST ACTS OF PRESIDENT HARDING IN ALASKA WAS THE DRIVING OF THE FINAL SPIKE COMPLETING THE TANANA BRIDGE, A CONCLUDING STEP IN THE ALASKA RAILROAD

of congress. This element was engaged in trying to bulldoze Mr. Harding into calling a special session of congress this fall to consider farm, financial and railroad legislation. Doubtless it will exert great pressure upon President Coolidge. The prediction is made that President Coolidge will not give in. As the presiding officer of the senate he became thoroughly cognizant of the shallowness of the radical-farmer appeal. He should be even less willing than Mr. Harding to go along with this thought. If a special session of congress were to be called this fall changes in immigration, tax and railroad legislation would be certain. If congress does not convene until Dec. 3, under the constitution, the heat of the situation may be dimmed and a more sane attitude prevail. But there is no disguising the danger in the fact that as now constituted the senate stands 49 to 46—there is one vacancy—for revising the Cummins-Esch act, and this is the one object the radical-farmer group is striving for.

President Coolidge once said: "Don't hurry to legislate. Give administration a chance to catch up with legislation." This typifies the man whom, it is believed, will be found as great bulwark to radicalism as the late President Harding and as untiring and firm for a square deal for both capital and labor as he was in defying the power of organized labor in Boston in 1919.

German Machine Makers Are Consolidating

Washington, Aug. 7.—Germany's economic disintegration and such attendant difficulties as the depreciation of currency, capital shortage, 8-hour day, labor disputes, excessive overtime wages and import restrictions of foreign countries worked so greatly to the injury of the German machine industry in 1922 that hitherto unorganized manufacturers were compelled to associate. By the end of the year, according to a report by Trade Commissioner Allport to the department of commerce, the number of organizations in the machine industry rose to 143, comprising 1150 firms and between 500,000 and 600,000 workmen, or about 90 per cent of the industry.

Supplies of raw and semimanufactured materials apparently gave a great deal of trouble to the industry in the past year. Some factories were able to obtain but 30 per cent of the material needed, the shortage of bar iron and thin plates being particularly acute. Frequent changes in iron prices led to complete disorganization of quotations in the industry and necessitated a general agreement on uniform prices so far as at present practicable.

The domestic demand upon which the industry largely relied declined seriously during the year and manufacturers were forced to depend to an increased degree on export sales. The export supplements required by the government embarrassed the industry considerably in its efforts to increase foreign sales and pressure has been exerted by the central association with some success to have them reduced. Manufacturers are generally adopting the practice of invoicing export sales in foreign currency; it is estimated that 30 per cent of the foreign sales of 1922 were made in this way.

Britons See Deep Loss in Harding's Death

By Special Cable

LONDON, Aug. 7.—The death of President Harding has shocked European business and industrial leaders. Sir William Larke, director of the National Federation of Iron and Steel Manufacturers, Sir Robert Hadfield and others state publicly that Harding's policies for disarmament and peace were among the few stabilizing factors tending toward business recovery throughout the world. The hope is expressed that American policies supporting world economic readjustment will remain unchanged, and that the radicals in the United States will not be able to seize an opportunity to confuse the domestic political situation and further unsettle the sorely troubled world.

Scrap Buying Still Dull

(*Continued from Page 356*)

than a week ago. A few orders for steel scrap are reported, with heavy melting steel and short steel rails reduced 50 cents to $11.50 and $12 a ton. Shipments to eastern Pennsylvania and Pittsburgh are light.

Some Buying Is Done

Buffalo, Aug. 7.—The New York Central railroad scrap iron and steel list just closed is said to have gone to Cleveland buyers at $17.50 and the Erie list at approximately the same figure to Youngstown. Some buying is going on here with consumers offering $16.50 but dealers holding out for $17.50. Dealers are storing a little scrap. The material being stored is No. 2 steel, flues, pipe, etc.

Buys 5000-Ton Lot

Pittsburgh, Aug. 7.—Since the Midland, Pa., purchase of a few thousand tons of heavy melting steel scrap at $17 to $17.50, the market has been quiet. During the past few days the Weirton Steel Co., Weirton, W. Va., bought at least 5000 tons at $17, and this is the largest new sale reported in several weeks. Dealers' buying prices on heavy melting steel are $16.50 to $17. Relatively high prices were paid on the recent railroad lists. For instance, the heavy melting steel on the central region list of the Pennsylvania lines brought around $18.25 while on the eastern region list from $18 to $18.50 were the prices realized on the major portion of the tonnage. Bids were high. The specialties brought $22 to $22.50 with other grades priced more or less in harmony. In the open market, axle and machine shop turnings are weaker by 50 cents. The Monessen, Pa., embargo still is on and the Woodlawn embargo has been modified a trifle to take in a carload per day under permits.

Buying Is Lacking

Cleveland, Aug. 7.—Scrap iron and steel buying in the Cleveland district is almost wholly lacking. Consumers not only refuse to be interested but are issuing numerous holdup orders applying to shipments on contract. As a result prices continue to decline, reductions of 25 to 50 cents a ton affecting practically the entire list.

Market Still Is Weak

Detroit, Aug. 7.—Weakness still prevails in the local scrap iron and steel market. Automobile cast, machinery cast and forge flashings are steady, while the remainder of the list shows an average decline of 75c with a large number down $1 from last week. Hydraulic compressed sheets are unchanged in the general market, but some sales $1 under the market are reported due to pressure from producers whose stocks are large.

Dealers say inquiry among producers fails to indicate any liberal buying will take place soon. Sales involve good quality material.

Market Is Unchanged

St. Louis, Aug. 6.—No change in the local scrap iron and steel market is noted. Purchases are limited and inquiries are absent. Dealers report it is impossible to interest consumers in offerings. Some borings are being taken by blast furnaces but not in volume. Steel specialties are abundant and show further weakness, while heavy melting steel was marked down to $16 to $16.50.

During the past three weeks several leading scrap interests picked up large tonnages. One yard acquired 4000 tons of mixed scrap. Scattered purchases by yard men represent a goodly aggregate. The St. Louis & Southwestern railroad closed 5000 tons. The Baltimore & Ohio is offering 16,000 tons including 2200 tons of miscellaneous rails. No scrap is coming from the country.

Quotations Still Are Weak

Birmingham, Ala., Aug. 6.—Scrap iron and steel quotations here are weak. Some old material is moving in limited tonnages. Yards are well supplied. The Gulf States Steel Co. is the largest melter of heavy melting steel buying in the open market. Railroad offerings continue to come out.

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Harding True to Business Americanism

PRESIDENT Harding was a loyal friend of business and industry. What is better, he was an intelligent friend. He recognized in a democracy and industrial country like the United States, the ends that business serve in promoting the general welfare. These ends he held paramount to considerations of immediate advantage or of seeming necessity of any class or group. Therefore, he could differ sharply with these directly concerned as to means and methods and still retain the cordial respect and good faith of all.

His views and policies with respect to business were those of a long-range character. By tradition and training a firm believer in the principle of protection, he was in no sense subservient or unduly solicitous of the interests of any special group. He believed in protection as a policy best calculated to advance and safeguard the economic good of the whole people. In his attitude on immigration restriction and no less clearly in his position on the elimination of the 12-hour day in the iron and steel industry, he displayed these qualities for far-sighted thinking and a clear conviction that gradually disarmed his opposition. In these questions manifestly his views were formed out of regard for the ultimate best interests of all immediately concerned but beyond that for the good of the country as a whole.

President Harding was possessed of an abiding Americanism, a belief in the dignity and responsibilities of faithful service and a common sense that carried him through where men of probably more brilliant attainments would have been less successful or would have failed: His even balance equipped him well for broadly grasping and wisely deciding questions of business where great consequences were entailed. Added to these good traits he was fortunate to receive and to weigh the advice of such outstanding minds so well versed in business and economic experience as Secretaries Hoover, Mellon and others of his cabinet. President Harding's everlasting virtue was that he not only surrounded himself with the best of advisors but that he wisely followed their counsels.

President Harding's administration will be recorded in history as a genuinely business administration. Not in many years, if ever, has business thought and interests been so eminently represen in the personnel, policies and outlook of a President and his immediate official associates. When many other high tributes, all deserved, will have been passed upon the public life and work of President Harding, he will best be remembered by those whose paths lie in commerce and industry, as having been true to the needs and rights of business no less or more so than to the interests of the entire country.

Is There Competition in Steel?

ONE of the first points for the iron and steel industry to be emphasized if a campaign of publicity is to be undertaken, as various steelmakers now favor, is the freedom of competition in the industry. The public long has been led to believe by some speakers and newspapers that have made a business of kicking capital that a combination of manufacturers exists to control prices and production, irrespective of public interest, and that this is responsible for what may appear to be fictitious values placed on some finished products. It may be said in all truthfulness that they have no conception of the extent to which iron and steelmakers will cut their prices, frequently below the level of profitable production, to obtain business; or of the vast amount of productive capacity available and that comes into action as demand picks up, thus serving to keep prices in check.

A better illustration of this cannot be cited than the recent high rate of pig iron production, that kept abreast of a greatly and almost suddenly enlarged demand. If the industry had not been capable, in other words, organized and capitalized, to meet the strain put upon it, prices would have

gone far beyond the levels attained. If the pig iron manufacturers had said: "We will hold down production so that we can get better prices" there would have been no limit to what they might have asked. But that was not part of the industry as now constituted; no more possible than it was desirable. A tremendous amount of capital is necessary to maintain the superb facilities upon which the consumers may draw. There is too much of a disposition to shout "wolf" when prices show a tendency to rise, and no disposition to commiserate with the manufacturers when they go down.

There is one outstanding point in recent experience that will give the public some means for making comparisons. When the demand for pig iron receded, prices went down to the level of or below production costs before furnaces began to discontinue. Usually, in some well-known industrial lines, production is cut far enough ahead so that prices do not have to be brought down.

If a buyer will go to a manufacturer of sewing machines, typewriters, automobiles or other finished products in which iron and steel are used, and ask him to cut his price to make a sale he is not like to get very far. He will be told that the price quoted is the standard price and cannot be changed. But, if the same manufacturer enters the market for pig iron or steel he will "shop around," get quotations from a half dozen or more interests, and use the lowest one to induce some one else to quote less. This is another one of the uncertainties for which iron and steel producers get little or no credit from the uninformed or misinformed. Why should he be called on to make these sacrifices, and not the manufacturer of the finished article? He also must figure his costs over a long period. The fact is that the supply of iron and steel is always held up to or a little above the demand, which insures competition and generally fair prices; a simple truth of which the general public has no knowledge, and which is ignored utterly by those who wish to mislead and deceive it.

Trade Horizon Is Clearing

MANY leading business forecasters are beginning to talk of a revival of trade and of prices this fall in a more confident tone. Good signs already appear in steel and the primary textile markets. Buying demand is broadening in a conservative yet noticeable manner in iron and steel and last week inquiries from all buyers of raw textile materials were far more encouraging.

Behind this quickening movement in basic industries is the fundamental impetus of continued large consumption of goods. Wages remain high, employment is still widespread, and American consumers are buying goods in unprecedented quantities. This is indicated by the surpassing records of car loading showing distribution of commodities on a scale hitherto unknown in this country.

Among the important forecasters to predict betterment in the fall are Brookmire's Economic Service and the Harvard Economic Service. In its current letter Brookmire's says:

"Preliminary July figures to date are of such a nature as to afford adequate confirmation of last month's indications of an upward trend of basic factors. As a result, this service definitely takes its position as bullish both on business and the stock market. As far as business is concerned, this indication of a renewed upward trend of fundamentals extends indefinitely the period during which activity may be expected."

The Harvard Economic Service is equally emphatic. It says:

"Money rates continue a favorable factor in the business situation. So long as this is true, the outlook remains good. We expect an active fall trade, which should check or reverse the decline in commodity prices; and with it an upward movement interest rates, at least equal to the usual seasonal advance."

The acute phase of the recent wave of pessimistic feeling concerning future conditions seems to have passed. Now the real fundamentals of the situation which have been more or less ignored in recent months are making themselves felt.

Welding Is Gaining Ground

WELDING occupies a somewhat unusual position in the field of applied science. For certain work it is accepted by architects, engineers and safety and insurance agencies without question, while for other purposes, some of which are not excessively exacting, the use of welding is forbidden.

This situation is not primarily an indication that certain welded jobs cannot be depended upon; rather, it is a reflection of caution prompted by the fact that welding has not been reduced to an "exact science." Unfortunately welded joints cannot be satisfactorily tested by nondestructive methods, nor can the quality of a weld be determined by the appearance of its surface. Therefore the reliability of welds is governed largely by the skill and trustworthiness of the individual welding operator.

Methods of welding have been improved so rapidly in the past five years that there has been little time to collect and classify the necessary data required to establish a reliable technique. The mere study of the stresses set up in welds of different types involves research requiring the expenditure of much time and effort. In justice to the welding industry, it must be said that a great amount of investigation and research work now is being prosecuted. The results may not be immediate, but in the end such work will lead to the acceptance, technically, of welding in a wide field of application.

Constructive Factors at Work

Important Influences Hold Over Business Sentiment—Good Earnings Indicate Industrial Prosperity—Signs of Reviving Buyers' Interest in Basic Lines Are Shown — Crop Values Are Greater

BY JOHN. W. HILL, FINANCIAL EDITOR

FOUR important influences have been holding sway over financial and business sentiment during the past week. They include the favorable earnings statements by leading industrial companies, the signs of some revival of buyers' interest in steel, textiles and other lines, President Harding's death, and the grave European situation.

The first two of these factors are distinctly constructive. Of outstanding interest was the second quarter earnings report of the United States Steel Corp., which greatly exceeded all expectations. This striking evidence of industrial prosperity was supported by similar favorable reports from equipment, automobile and other companies. It is true that these statements cover a past period. It was a period, however, during which business was popularly supposed to be sliding down hill. With consumption continuing heavy and signs of improving demand in various directions it is probable that the earnings for the last half of the year may hold up well.

The failure of the stock market to betray any serious disturbance over the economic consequences of President Harding's death was in accordance with past performances on similar occasions. The change at the head of the Republican administration does not mean any important change in policies. Moreover the business and financial situation has a way of developing under the influence of existing economic conditions rather than those of a political nature. The only unsettling factor of the political horizon is the growth of radicalism under the sun of economic discontent in the agricultural regions.

Radical legislative tendencies could be checked by improvement in crop prices and by the development of a personality by President Coolidge capable of guiding public opinion along sound constructive lines. That is a strong probability. As for the farmers, the government estimates that important crops will bring them $1,000,000,000 more than last year. Only wheat suffers by comparision with 1922 values. Over Europe the heavy cloud of the Ruhr still hangs.

Evidence of the distinct improvement in industrial finances is found in the record of commercial insolvencies for July. In that month the number of failures throughout the country as reported by R. G. Dun & Co., was 1231. This was the smallest total since November, 1920. Liabilities amounted to $35,721,000, a slight gain over June. With that exception they were the smallest of any month in two years and a half. This showing reflects the stronger financial position of business houses.

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The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One mo. ago	One year ago	Average 1913
Business failures	325	372	352	...	300
Cash ratio Fed. Res. System	77.3	78.2	74.4	79.6	...
Loan rate, 4-6 Mo. N. Y. (per cent)	5	5	4¾-5	4	6-6½
Average 25 ind'l shares	$100.55	$101.29	$102.46	$103.68	$58.19
Average 25 rail shares	$54.97	$56.54	$58.22	$67.64	$82.97
Aver. 40 bonds	$76.08	$76.49	$75.85	$81.42	$93.00
Car loadings (week ended July 21)	1,028,000	1,019,667	1,002,740	861,124	*928,418
Bank debits 247 cities (000 omitted)	$8,720,819	$8,582,000	$9,401,212	$8,670,000	.....

*1920

FOREIGN EXCHANGE (Demand)

	Normal	Aug. 6 (close)	Week before	Month ago	Year ago
Sterling	$4.86	$4.56	$4.57	$4.56	$4.45
Francs	19.3c	5.77c	5.89c	5.80c	8.20c
Lira	19.3c	4.34c	4.34c	4.21c	4.63c
Marks	23.8c	0.00004c	0.00009c	0.0004c	0.14c

MONTHLY COMPARISON

	June	Month before	Year ago	Monthly average 1913
Dodge building Awards in 36 states	$371,034,000	$433,906,000	$395,000,000	$82,126,000
Business failures:				
Number	‡1231	1358	1753	1336
Liabilities	‡$35,721,188	$28,678,276	$40,010,313	$22,732,000
Exports	$312,239,000	$316,648,000	$335,116,000	$207,000,000
Excess of gold imports	$18,885,000	$44,531,887	$11,375,882	†$630,716
Bureau of Labor Price Index	153	156	150	100
Bradstreet's Price Index	141.5	144.3	131	100
Economist's British Price Index	‡4182	4301	4396	2717
Cost of Living Index	160.1	160.3	104.5	100
New incorporations	‡$724,920,000	$1,403,336,000	$634,259,000	$172,301,000
Railroad net earnings	*$89,999,600	$83,197,800	$62,069,000	$59,900,000

*May. †Monthly average excess exports. ‡July.

The Business Trend

August 9, 1923

TRADE TODAY, TOLD BY IRON TRADE CHARTS

GENERAL SITUATION—Commodity prices in June halt march upward; Steel company earnings largest since 1920; car loadings again set record mark with corresponding decrease in net surplus; cotton consumption drops sharply in June; weakness and instability continue in financial markets; iron and steel buying movement becomes stronger.

COMMODITY PRICES—United States bureau of labor wholesale index falls from 156 in May to 153 in June; IRON TRADE REVIEW composite of 14 iron and steel products drops five points from 178 in June to 173 in May.

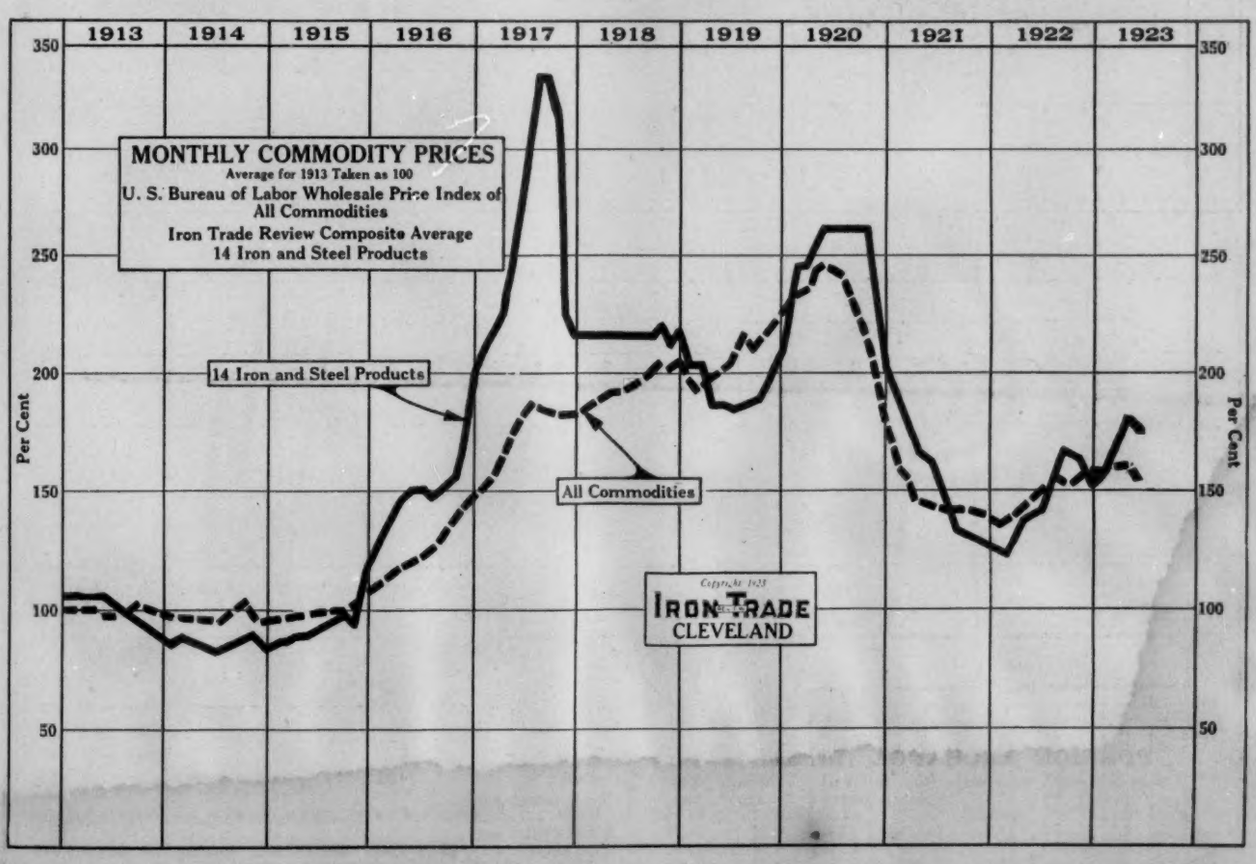
FREIGHT MOVEMENT—Car loadings for week ended July 21 set new high record of 1,028,927 cars, recording start of fall peak load; net car surplus drops to 71,-819.

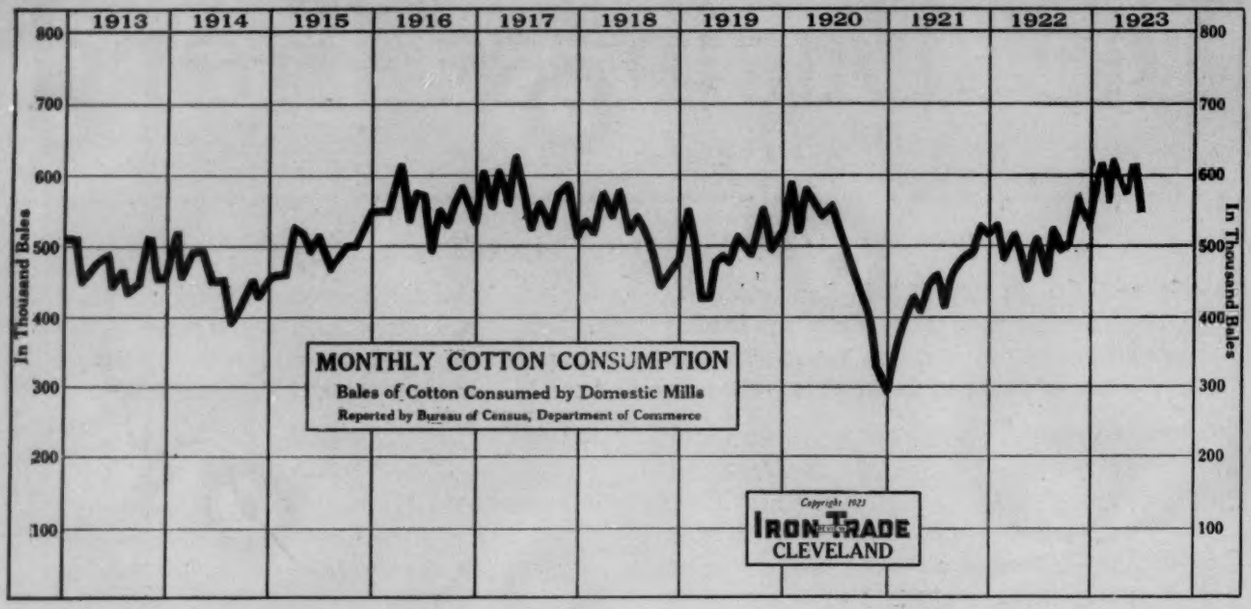
CORPORATION EARNINGS—Second quarter statement of United States Steel Corp., reports largest earnings since quarter ended Oct. 31, 1920; $47,858,181 earned in the quarter just ended.

PRICE PARITY—Monthly average of steel bar prices in July maintains high level reached in June at $48.00; July average of basic pig iron continues decline started in April, falling from $27.35 in June to $25.15 in July.

COTTON CONSUMPTION—Monthly cotton consumption in June as reported by United States bureau of census falls from 620,000, bales in May to 542,000 bales in June.

DOLLAR VALUE—Increasing costs of living continue to shrink the purchasing power of the dollar; June dollar worth 62.4 cents as compared to July 1914; value smallest since January 1922.

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In Thousand Bales
MONTHLY COTTON CONSUMPTION
Bales of Cotton Consumed by Domestic Mills
Reported by Bureau of Census, Department of Commerce
Copyright 1923
IRON TRADE
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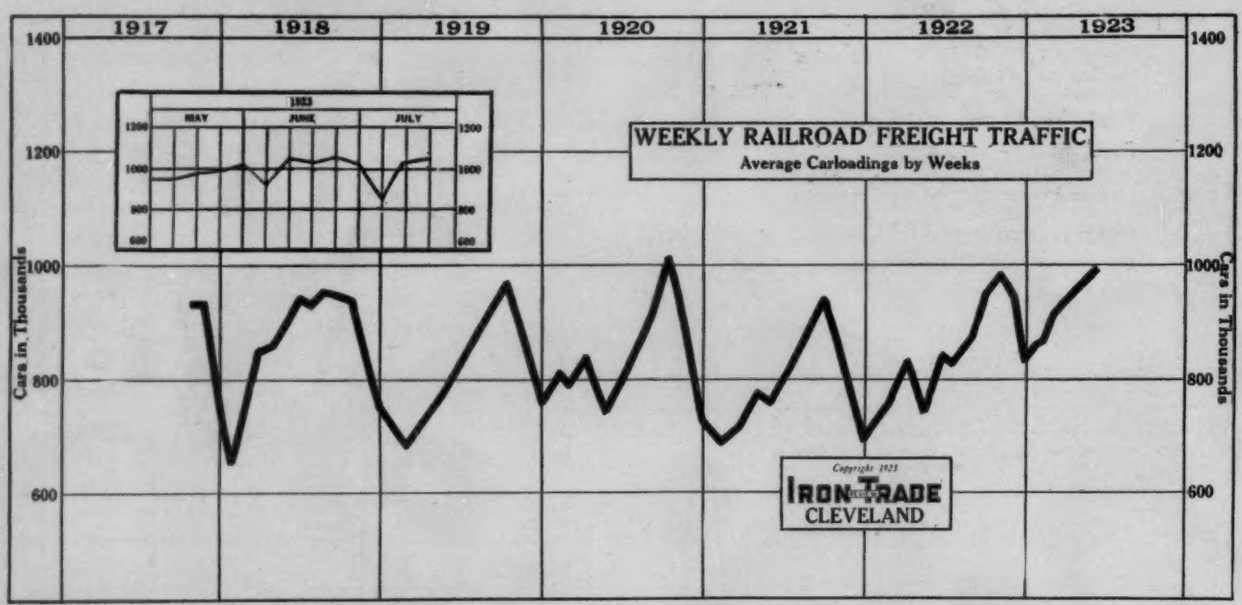
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WEEKLY RAILROAD FREIGHT TRAFFIC
Average Carloadings by Weeks
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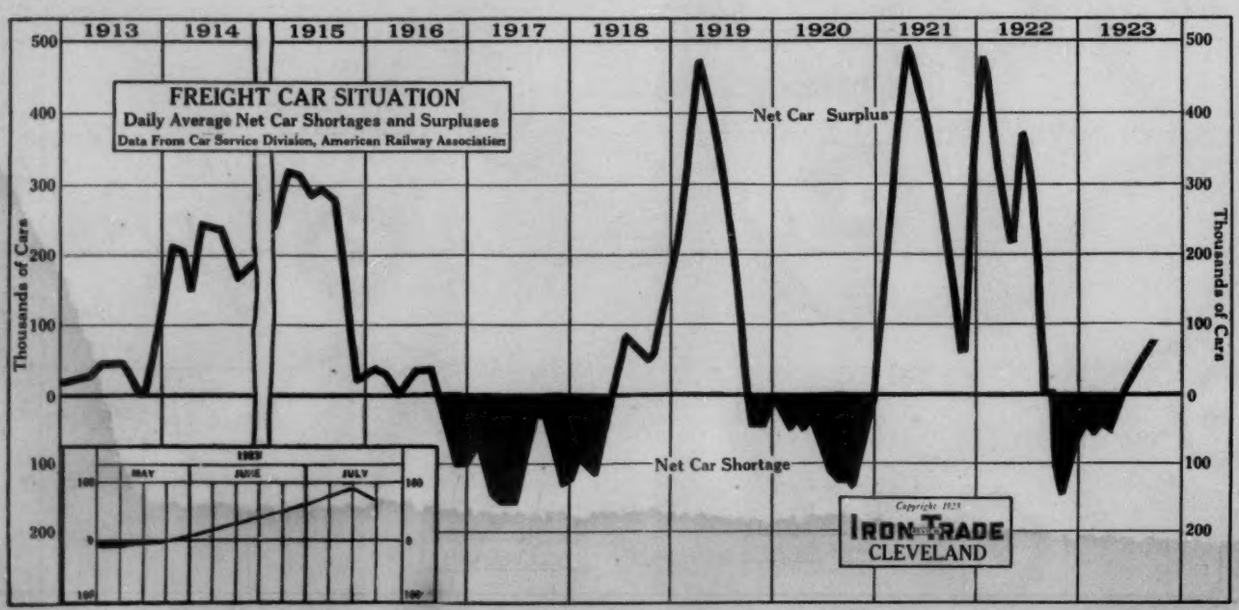
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FREIGHT CAR SITUATION
Daily Average Net Car Shortages and Surpluses
Data From Car Service Division, American Railway Association
Net Car Surplus
Net Car Shortage
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Copyright 1923
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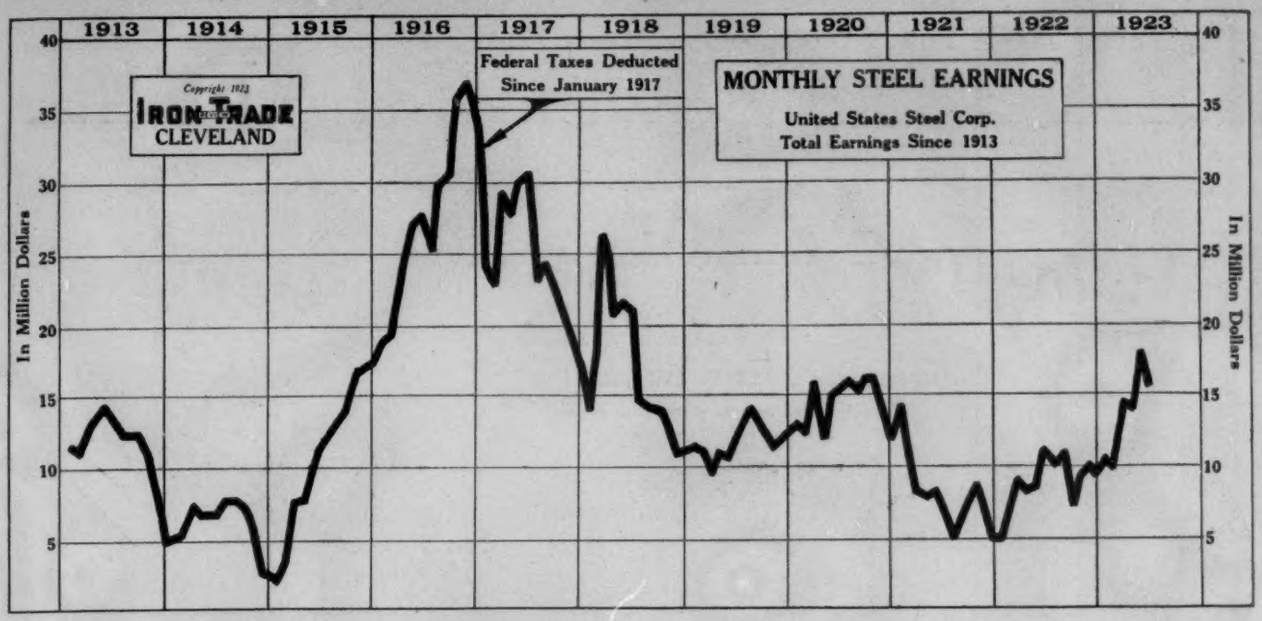
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In Million Dollars
Federal Taxes Deducted Since January 1917
MONTHLY STEEL EARNINGS
United States Steel Corp.
Total Earnings Since 1913
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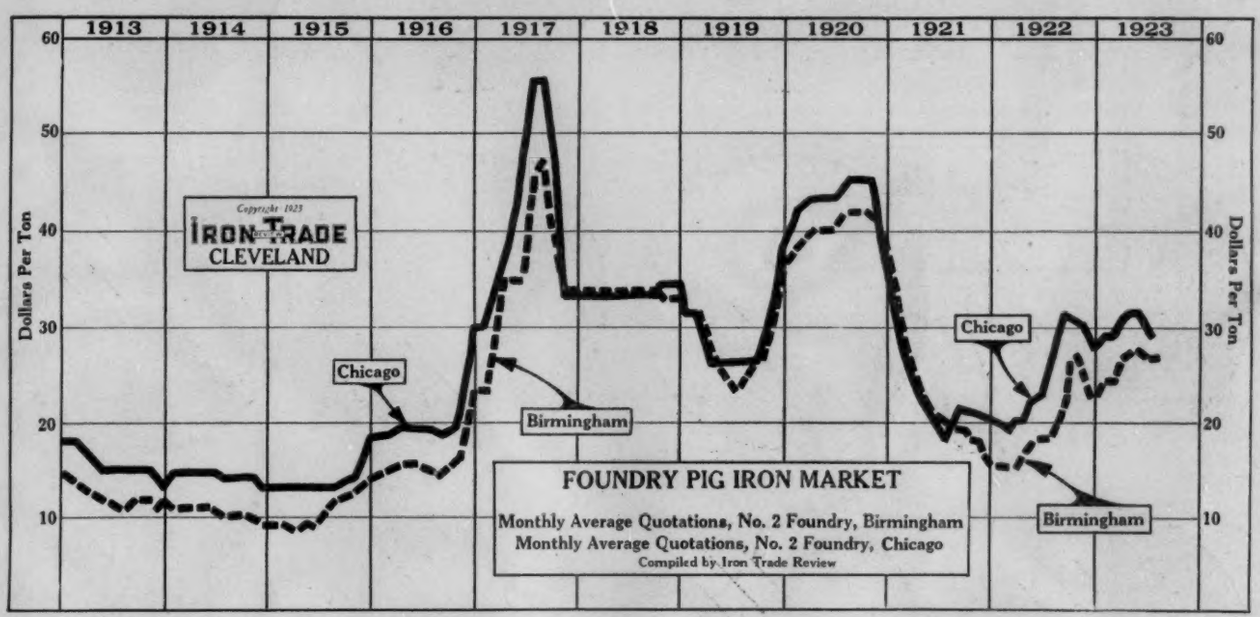
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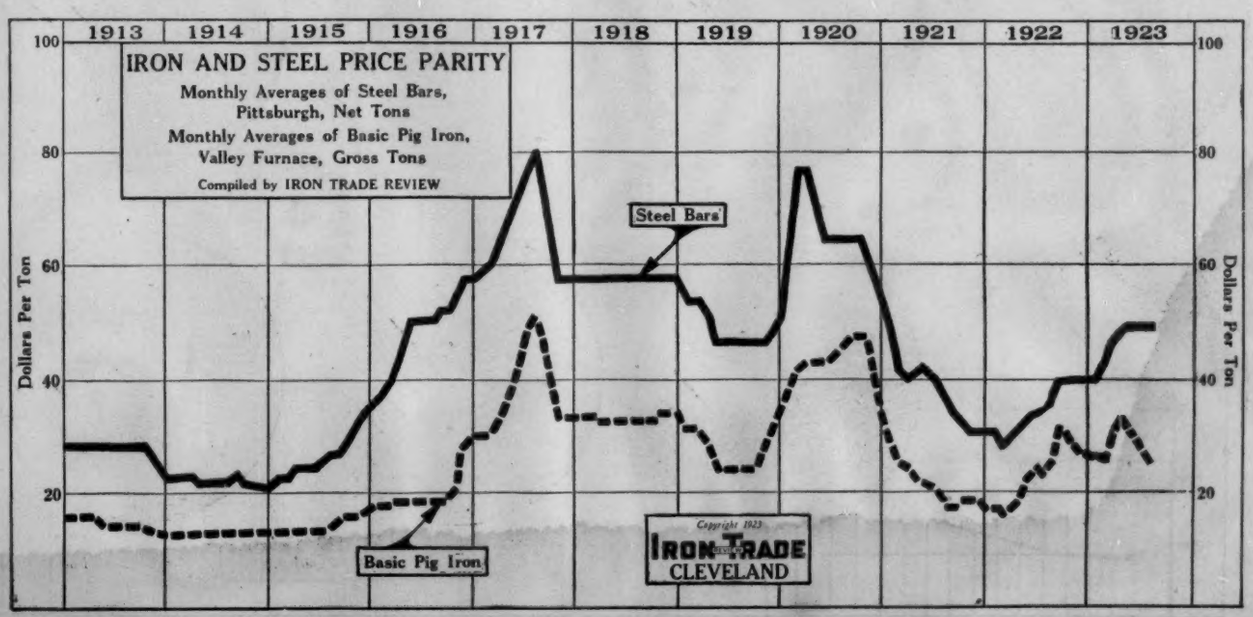
Dollars Per Ton
Copyright 1923
IRON TRADE
CLEVELAND
Chicago
Birmingham
Chicago
Birmingham
FOUNDRY PIG IRON MARKET
Monthly Average Quotations, No. 2 Foundry, Birmingham
Monthly Average Quotations, No. 2 Foundry, Chicago
Compiled by Iron Trade Review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Dollars Per Ton
IRON AND STEEL PRICE PARITY
Monthly Averages of Steel Bars, Pittsburgh, Net Tons
Monthly Averages of Basic Pig Iron, Valley Furnace, Gross Tons
Compiled by IRON TRADE REVIEW
Steel Bars
Basic Pig Iron
Copyright 1923
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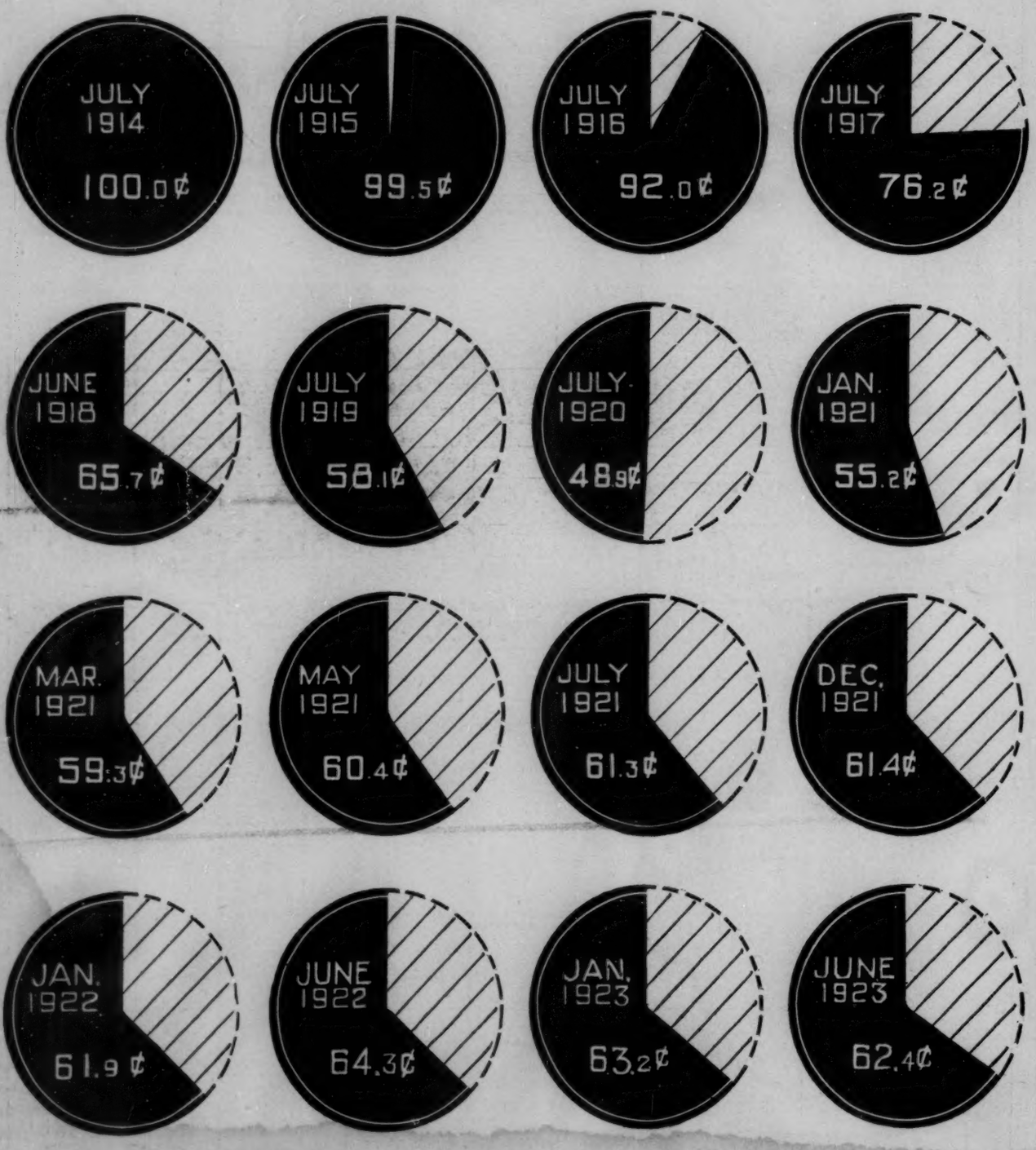
CLEVELAND

Purchasing Power of the Dollar

Showing Fluctuations from 1914 to Present Time

Based on Cost of Living

Retail Prices



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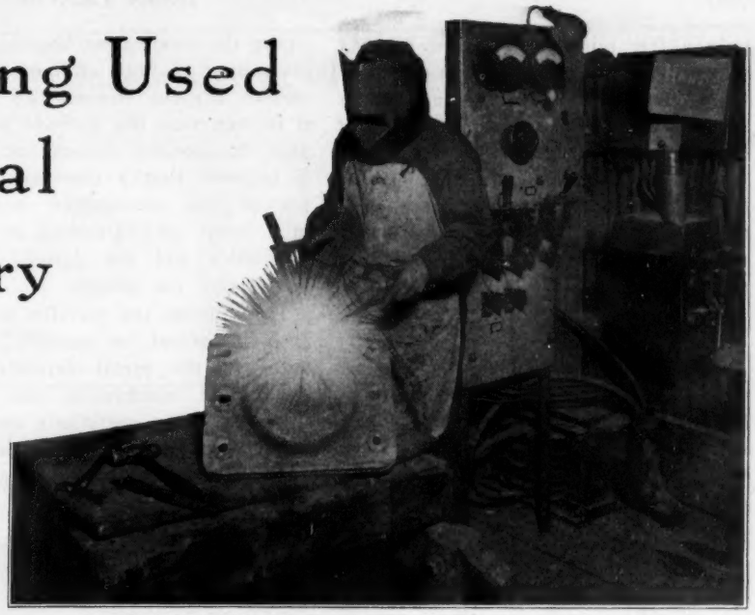
Electric Welding Used Widely in Metal Working Industry

BY P. P. PIPES



Filling in a large hole in a steel casting, using a carbon arc

USE of electrical energy for welding, in the metal working trades passed from the experimental to the practical stage many years ago. Yet, today many products are being made by riveting and various other methods which could be manufactured by the use of electric welding at a greatly reduced cost.

Electrical energy can be utilized in two ways, thus there are two distinct methods of electric welding, namely, "resistance welding" and "arc welding". In the former method, the parts to be welded are brought to a welding heat by passing through them current of such amperage that the energy developed is great enough to heat the pieces to a welding temperature. With the application of a slight pressure, the weld is completed. In the latter method, an electric arc is drawn between the work and an electrode in such a manner that the heat from the arc melts the metal to be welded, thus causing the parts to be united.

Divided Into Two Groups

The resistance method of welding may be subdivided into two distinct groups, the "incandescent" welding process which was developed by Elihu Thomson in 1886, and the "percussion" welding process as developed by L. W. Chubb only a few years ago. In the incandescent process, the pieces to be welded are held together by means of clamps or springs so as to exert a constant pressure even after the surface become plastic. A transformer is used to transform the alternating current energy to a low voltage with high amperage. This process is used for butt or lap welding steel bars, pipes, cutting parts of tools to the shanks, etc., and also is used extensively for spot welding of sheets in the sheet metal industry.

In the percussion process, a condenser of proper capacity is discharged at the instant the pieces to be welded are forced together, and the heavy discharge of current heats the parts and welds them. This process is applied mainly to the welding of wires of the same or dissimilar metals, or to the welding of the end of the wire to a larger metallic object. The ocsillograph shows that the weld is completed in from 0.001 to 0.003 seconds and consumes from 0.001 to 0.002 watt-hours of energy, depending on the size of the weld. Almost any kind of metal can be welded by the percussion process, therefore, it is adapted particularly to the jewelry trade for welding platinum, gold, and silver, or for electrical purposes in attaching contact points of platinum, tungsten, silver, etc. It is important to note that the incandescent process makes use of alternating current, while the percussion process makes use of direct current.

First Used to Weld Lead

The electric arc welding process appears to have been first used in 1881 by Meritens for welding together lead plates of storage batteries, a carbon arc being used. Since that time, several systems have been developed, yet the two most generally used today are the Slavianoff or "metallic arc" process and the Bernardos or "carbon arc" process. The temperature of the electric arc depends upon the temperature at which vaporization occurs for the particular kind of electrode used. For instance, copper vaporizes at 2100 degrees Cent., iron at 2450 degrees Cent., nickel at 2450 degrees Cent. and carbon at 3600 degrees Cent. Naturally it follows then that the amount of carbon in metallic electrodes influences the arc temperature. The light emitted from an electric arc is made up from two kinds of rays, the infra red rays and the violet rays. If the human skin is exposed to the infra red rays for

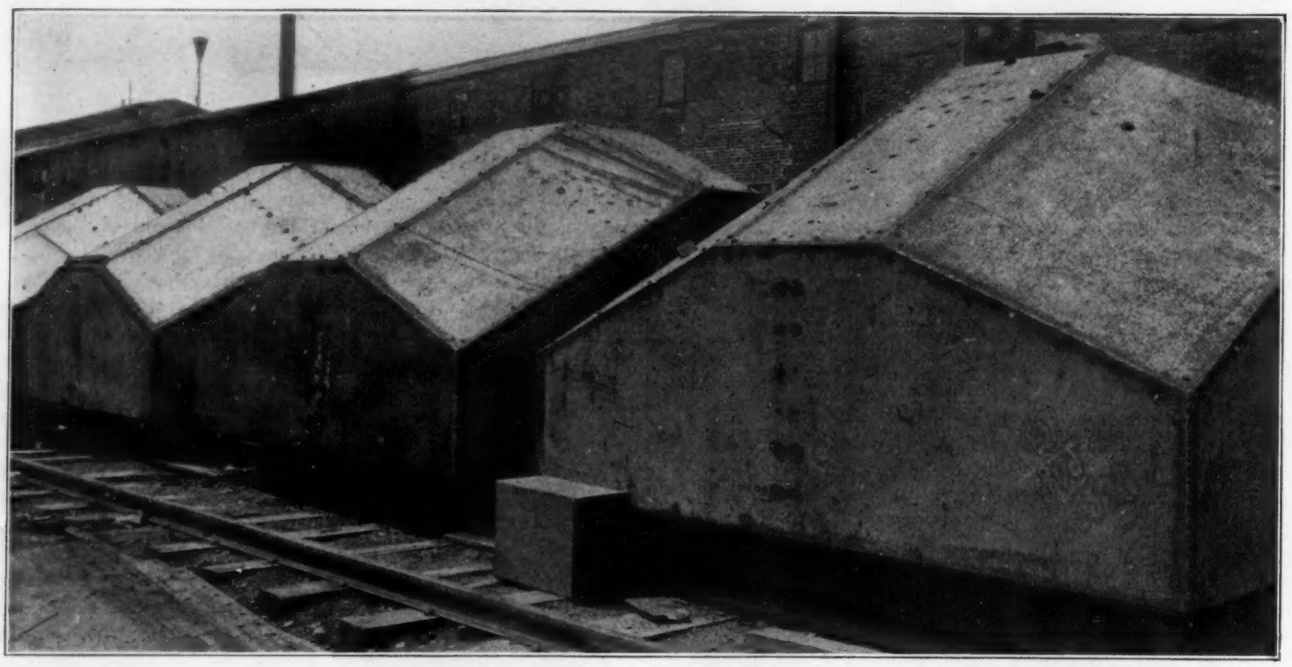
Welding Processes Are More Widely Used

MANY manufacturing operations in the metal working industry, operations well within the province of welding, now are accomplished by riveting or other means, even though the cost be greater. This is due to the fact that engineers have not yet had sufficient experience and contact with welding to enable them to repose complete confidence in its use. No doubt this condition is due to the fact that to date no nondestructive methods for testing the efficiency of welds has been developed. Thus while one weld tested physically may be satisfactory, there has been no assurance that another of the same type may be the same. In spite of this, however, welding has become more and more popular. This article discusses electric welding at length and shows what is being done to make its use more reliable.. The author describes both resistance and arc welding and points out the applications of each, giving examples and results of tests to substantiate his statements. The author is a welding engineer, in the New York office of the Lincoln Electric Co., Cleveland.

only a few minutes, a severe burning takes place quite similar to that received from exposure to the sun for a much longer period, consequently it becomes necessary for the operator to protect both hands and face against these injurious rays. Everyone is familiar with the violet rays and surely there can be no injurious effects from them.

Heat Generated Is Measured

In the direct-current metallic arc there is a difference in the amount of heat liberated in the anode, or positive, and cathode, or negative, zones depending upon the analysis of the electrodes used. A simple experiment



FRESH WATER TANKS FOR A TUGBOAT AFTER THE WELDING OF ALL JOINTS HAD BEEN COMPLETED

was performed by the writer recently to determine this ratio of heat distribution. It was assumed that by holding an arc between two electrodes of the same diameter and composition, in a straight line and horizontal plane, the amount of burn-off on the positive and negative electrodes was directly proportional to the amount of heat liberated in the anode and cathode zones respectively. The current density in all the electrodes was maintained approximately constant at 10,000 amperes per square inch cross section.

The results obtained are shown in the accompanying table. This table is not accurate by any means, as only a few electrodes were tested, yet the results prove that with an increase of carbon content in the steel electrodes there is an increase in the percentage of heat liberated in the cathode zone accompanied by a decrease in the anode zone. For iron and mild steel electrodes the anode zone liberates a greater amount of heat, although when the carbon content exceeds 0.5 per cent, it is seen that the cathode zone liberates the greater amount of heat. It is believed that a thorough investigation of this phenomenon would result in a better understanding of arc characteristics and the correct procedure in applying the process.

In applying the metallic arc process it is important to consider the character of the metal deposited as regards the mechanical and chemical properties. The conditions under which a metallic arc weld is made cause it to have a mechanical structure similar to an inferior steel casting. With the proper electrodes it is possible to make the deposit hard or soft, high or low in tensile strength, but the coefficient of elasticity always remains small and the modulus of elasticity remains about the same for the deposited metal as for rolled stock of similar composition.

The ultimate tensile strength of properly made flush butt welded joints runs around 90 to 95 per cent of that of standard rolled stock and by reinforcing the welded joint with additional metal, more than 100 per cent strength can be obtained in the weld as compared to the rolled plate. F. B. Webster, naval architect, reported a series of tests as made on treble lap joints; full fillet arc welded lap joints, both edges; and arc welded butt joints with the following results:

Type of weld	Thickness, inches	Efficiency, per cent
Treble riveted, lap joint. .	0.53	62.5
Lap weld, full fillet, both edges	0.514	71.0
Butt weld, not strapped.	0.505	96.0

On a series of tests for alternating stresses it was found that full fillet lap welded, both edges and treble lap riveted joints would endure about 60 per cent of the number of alternations of a similar plain plate while a butt welded joint would withstand about 70 per cent.

The ultimate shearing strength of arc deposited metal is considerably lower than the tensile strength. On a series of tests the writer obtained the following results:

Bar size inches	Amount of lap, inches	Size of electrode, inches	Ultimate shearing strength, pounds per sq. inch
2x½ to 3x½	3.5	3/16	35,300
⅝x⅝ to 1¼x½	2.0	3/16	30,000

These results are slightly lower than might be expected, for in most all cases parts of the parent metal pulled out as a result the welds being made parallel with the grain or fiber of the steel bars. In the fabrication of structural shapes, it is evident that diamond shaped plates are far better than rectangular plates since a greater shearing strength per square inch can be developed and the plate area can be reduced over 50 per cent.

Unsoundness May Be Avoided

A microscopic analysis of arc deposited metal reveals a considerable number of cavities and oxide inclusions which occur indiscriminately throughout the crystals of iron. This unsoundness may be avoided to some extent if extreme precaution is taken during fusion, however, it is impossible to eliminate these imperfections entirely. The oxidation takes place when the oxygen of the air combines with the iron forming

iron oxide, and theoretically it would seem that with small electrodes and small currents there would be more oxidation proportionately than with large electrodes and large currents since the amount of oxidation should depend upon the ratio of area to volume of arc stream, and the area increases only as the diameter, whereas the volume of arc stream increases as the square the diameter. This however, does not hold true, as welds made with ⅛-inch electrodes do not seem to contain any more oxide inclusions than welds made with 5/32 or 3/16-inch electrodes.

Nitrogen Has Little Effect

Another characteristic feature of arc fused metal as found by the bureau of standards investigation, is the presence of numerous needles or plates due to nitrogen being taken up by the iron during the fusion. Pure iron which has been nitrogenized gives the same appearance and is similar in behavior to arc fused metal upon heating. It is interesting to note the large increase in the nitrogen content, which is approximately 0.13 per cent for either pure iron or mild steel electrodes. This high nitrogen content would be regarded as undesirable in ordinary steel, yet apparently it does not seem to influence the mechanical properties of arc fused metal. The other imperfections far overshadow any possible defect of the nitrogen content. The use of coated electrodes apparently does not affect the amount of increase in the nitrogen content of arc fused metal.

Another interesting feature to note is that the carbon content of arc fused metal is about the same when either iron or mild steel electrodes are used, this amount being about 0.02 per cent. The chemical analysis of arc fused metal as compared to that of steel electrodes used, shows that the carbon, silicon, and manganese content are almost oxidized away during the welding process, while the sulphur and phosphorus content remains about the same. Manganese being a good deoxidizing agent, is helpful in decreasing the oxidation which takes place and therefore, is, a valuable constituent in mild steel electrodes. Sulphur and phosphorus should be kept as low as possible as these are harmful elements.

Heat Treatment Improves Metal

The bureau of standards made some exhaustive heat treatment tests of arc welds which consisted mainly of quenching the specimen in cold water after heating for a period of 10 to 15 minutes at a temperature of 925 to 1000 degrees Cent. The specimens were then tempered at different temperatures ranging from 650 to 925 degrees Cent. for periods of 10 to 20 minutes. This heat treatment apparently eliminates about 50 per cent of the nitrogen content, however, as stated previously, the nitrogen content has little influence on the ultimate tensile strength of the welded joint.

Consumption of Metallic Electrodes

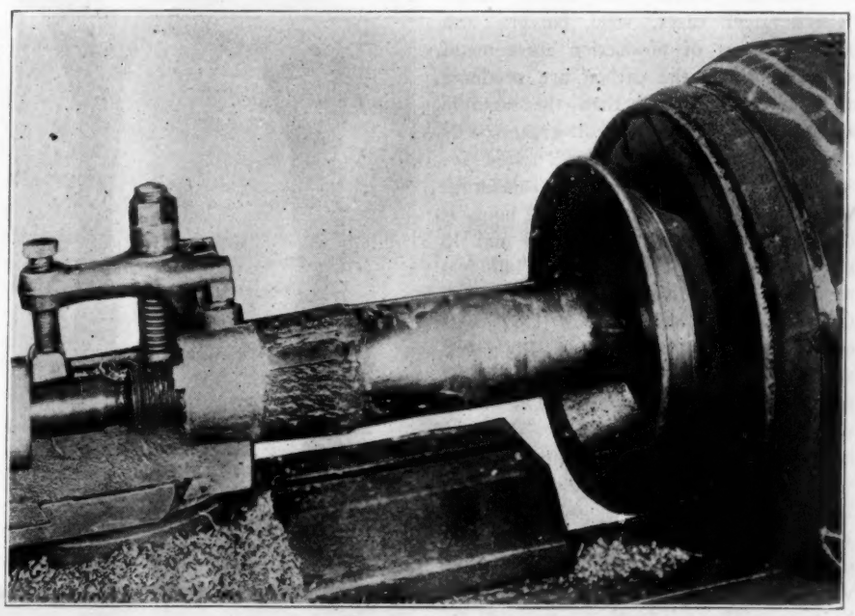
Material	Type of electrode: Carbon, per cent	Type of electrode: Diameter inches	Amount of burn off: Positive electrode: inches	Positive electrode: Per cent of total	Negative electrode: inches	Negative electrode: Per cent of total
Steel	0.15	5/32	3.50	54	2.94	46
Steel	0.10	3/16	3.81	57	2.88	43
Steel	low	1/8	5.06	57	3.81	43
Steel	low	1/8	4.50	59	3.13	41
Steel	0.60	5/32	3.75	48	4.13	52
Steel	0.12*	5/32	4.00	58	2.94	42
Steel	low *	5/32	4.69	60	3.13	40
Steel	0.15	5/32	3.50	47	3.88	53
Monel metal	*	1/8	4.25	44	5.32	56
Cast iron	3.5	1/4	3.13	44	4.00	56

By giving arc fused metal a heat and mechanical treatment, E. H. Escholtz found it was possible to improve the tensile strength and also to enable the weld to withstand fatigue and vibrating stresses. On one particular sample of chrome vanadium steel which was heated and forged after welding, he obtained a tensile strength of 132,000 pounds per square inch with a reduction in area of 5.6 per cent. This heat and forge treatment does not seem practical, yet when we consider the various uses to which we find the hammer-gas process applied today, there are probably many welded jobs which could be given this treatment. The main objection would be the additional expense for equipment, time, etc.

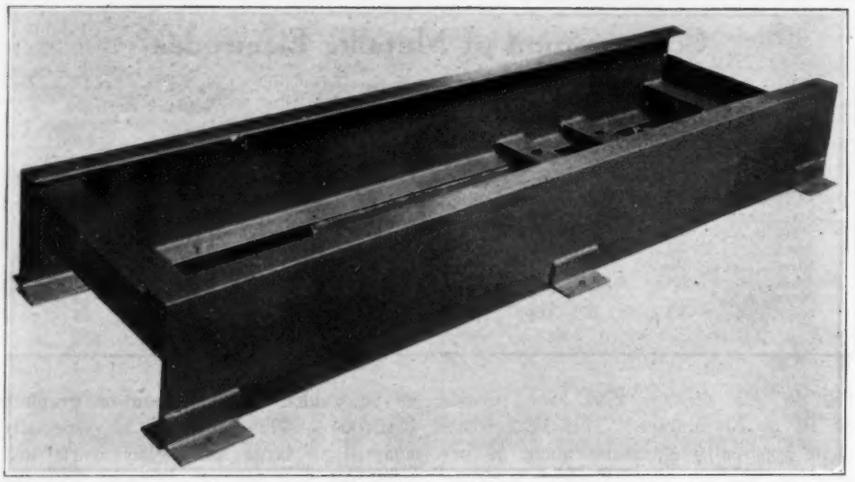
In the Bernardos, or carbon arc process, an arc in drawn between the work to be welded and a carbon or graphite electrode. This process is especially adapted to large and heavy work, and until the last five or six years was the most extensively used. Best results are obtained by using the work as the positive terminal and the carbon electrode as the negative terminal since a reversed condition will cause carbon from the electrode to be carried into the work resulting in high carbon steel, also, the carbon electrode will burn off much more rapidly with the reversed condition.

Foundries Use Carbon Arc

The carbon arc is used extensively in steel foundries for cutting off risers, building up surfaces, and filling in holes, etc. Where used for cutting, the arc actually melts the metal away, so it is necessary to make the width of the cut sligthly greater than the size of the electrode. The smoothness of the cut depends largely upon the skill of the operator, however, because the arc has a tendency to jump from one point to another, it is not possible to make as smooth a cut as is made with the oxy-



AN ARC WELD IS MACHINED AS EASILY AS CAST STEEL. IN THIS CASE AN ARMATURE SHAFT WHICH WORE DOWN IN SERVICE WAS BUILT UP AND TURNED DOWN IN THE LATHE



A STEEL BED FOR GASOLINE ENGINE DRIVEN MACHINERY CONSTRUCTED BY WELDING TOGETHER ELECTRICALLY STANDARD STRUCTURAL SHAPES

acetylene torch. Usually 300 to 1000 amperes are used in cutting, depending on the thickness of metal to be cut. The speed of cutting will range from 1/3 to 3/4 square inch cross section per minute per hundred amperes in the arc, depending upon the amount of arc current and thickness of plate. With a reasonable power rate, the cost of cutting with the electric arc is lower than the cost of cutting by means of the gas torch.

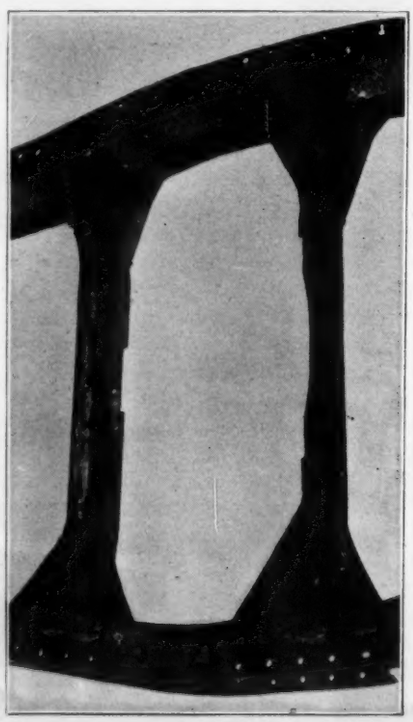
Develop Automatic Machine

Up until about one year ago, the carbon arc was operated entirely by hand and was applicable only to heavy steel castings, forgings, cutting off risers, etc. During the past year, the Lincoln Electric Co., Cleveland, has developed an automatic carbon arc welding machine for the longitudional and circumferential seams of tanks, range boilers, steel cases, steel barrels, and similar classes of production sheet metal welding. Since the carbon arc produces a higher temperature than the metallic arc, with the proper control, great speeds of welding can be obtained. For instance, on ¼-inch plate, butt reinforced welds, a speed of 35 feet per hour is obtained easily, while on 14, 16 and 18 gages, speeds of 100, 110 and 140 feet per hour respectively, can be obtained. On full fillet, single weld, lap joints on ¼-inch, 12, 14, 16 and 18 gages, speeds of 45, 100, 120, 150 and 175 feet per hour can be obtained. On flange welding, for example, where the two edges are turned up and melted together without using any filler material on 12, 14, 16 and 18 gages, speeds of 125, 150, 180 to 200 feet per hour can be obtained. In the case of butt welds, the welding wire is placed along the seams before welding and the carbon arc in passing over, fuses both the wire and the base metal. In the case of lap, flange or corner welding, no welding wire is used, as the base metal is merely fused together.

The microstructures of carbon arc welds show a more homogeneous metal and a less number of oxide inclusions than are found in metallic arc welds, which results in a higher tensile strength. Mechanical tests also show a marked increase in ductility, accompanied with a larger coefficient of elasticity. The following is the result of tensile tests made on ¼-inch plates butt welded with the carbon arc:

Size of weld, inches	4.15x0.252
Yield point, pounds per square inch	37,760
Reduction in area, per cent	52.7
Elongation, per cent	24.3
Ultimate tensile strength, pounds per square inch	57,220

With a great increase in the speed of welding, with the improvement in the mechanical and chemical qualities of the welded joint, and with the elimination of the human element of personal skill, it is apparent that this method of welding, for production jobs where a large number of pieces of the same character are to be produced, is superior to the hand metallic process. Great developments in welding can be expected in the near future in the manufacturing industry as welding costs are cut to a low value with this process.



THIS AUTOMOBILE FRAME WAS WELDED ELECTRICALLY INSTEAD OF RIVETING AND SUBJECTED TO A SEVERE BENDING STRAIN

In the electric arc welding industry today, we are confronted with one serious problem, that of obtaining a sufficient number of operators who can be relied upon to produce uniformly sound welds. Of course, in any welding enterprise of magnitude, it is necessary to have at the head a competent engineer who is thoroughly familiar with design of welded joints and up to date welding practices. Under him should be a practical foreman who has a thorough knowledge of the process as applied to the particular work at hand and a sufficient experience in actual welding practices.

The making of sound welds depends upon many things, such as design of joint, quality of metal to be welded, quality of welding wire, welding equipment, and characteristics of the operator. The last item undoubtedly is the most important of all, thus in choosing men to do welding work, we should be assured that they have a sense of responsibility for safety, that they have the necessary mental and physical qualifications, that they have ingenuity and resourcefulness, and last but not least, that they take a pride in their work and always have that conscience in their job that spurs them on to greater efforts.

How Welded Joints Are Tested

Tests for arc welded joints can be divided into two groups, namely, destructive and nondestructive. Of course, with a destructive test such as applying a hydraulic pressure to a welded tank or pulling a welded bar in a tension machine, it is possible to determine exactly the mechanical properties of a welded joint, yet the test ruins the specimen for any useful purpose. If the variables entering into the making of a sound weld as previously stated, could be controlled within a narrow range, all of which can be with the exception of the operator, then the destructive method for testing would be quite satisfactory.

Many methods of nondestructive tests have been proposed from time to time, yet none seem to determine to any degree of accuracy what might be expected of a welded joint. The magnetic reluctance tests consists of apply-

ing a certain magnetomotive force between two points of the weld and noting the number of lines of force set up in the welded metal or in other words; measuring the reluctance of the welded metal. The electrical resistance test consists of applying an electromotive force across the weld and measuring the current flow therein, which determines the resistance of the metal. A greater resistance or reluctance signifies a greater number of imperfections in the weld. Either of these two tests determines to some extent the quality of the welded metal, yet great difficulties are experienced in making the test and getting satisfactory results. It is stated that the combination of the two methods will determine to within the order of 10,000 pounds per square inch, the tensile strength of a welded joint, which of course, would be satisfactory for most work. A test with air pressure or kerosene of course, would determine if the weld was porous, however, it would indicate little regarding the tensile strength.

Metals That Can Be Welded

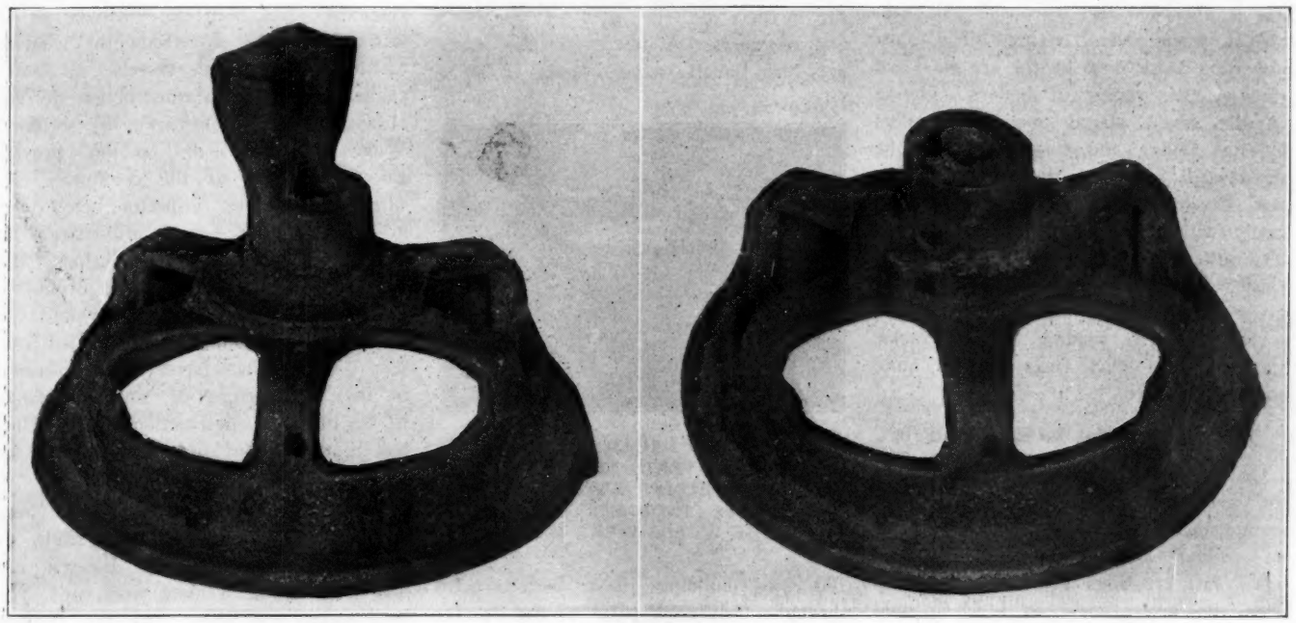
Electric arc welding has been used quite satisfactorily on various kinds of metals such as brass, bronze, copper, nickel, monel metal cast iron etc., however, the application of mild steel and iron products comprises perhaps over 90 per cent of the total arc welding applications. In the welding of brass, bronze or copper, the use of a phosphor bronze electrode with reversed polarity is satisfactory. Also the carbon arc is used in a great number of cases.

Monel metal, which is composed of about 65 per cent nickel, 30 per cent copper and 5 per cent of other elements, can be welded best using monel metal electrodes coated with some deoxidizing agent. Considerable research work was carried on by the International Nickel Co. in this field and a coating was developed that worked satisfactorily for the arc welding of monel metal.

Use Special Coating

This coating consists principally of manganese, magnesium and silicon in the proper proportions, mixed with either shellac or sodium silicate for a binder. In using this electrode, the work should be made negative and the rod positive, and only one layer of metal used. Welds of monel metal when properly made, show a high ductility and high tensile strength. Some test samples showed an ultimate tensile strength of 47,000 pounds per square inch with an elongation of 9.7 per cent.

Considerable controversy exists between experienced welding men in the welding of cast iron with the electric arc, since some claim much greater limitations than others. Both the carbon and metallic arc processes are used, depending upon the size and conditions under which a piece must be welded. Where it is possible to preheat a casting and weld with a carbon arc using a cast iron filler rod, a good weld is obtained on an average grade of cast iron. In most cases as it is necessary to weld the casting cold the metallic arc process is used, and either steel, monel metal, nickel, or phosphor bronze electrodes are used. Using a steel welding rod makes a hard deposit at the point of fusion between the cast iron and the added metal, as the free carbon of the iron combines with the steel, making high carbon steel. By using phosphor bronze, monel metal or nickel electrodes, this hard metal can be eliminated and fairly strong welds can be made. In the latter case, the electrodes should be coated with a deoxidizing agent and a reverse polarity used the welding rod becoming positive. In making cast iron welds for strength and tightness, such as the welding of cylinders for steam engines, air compressors, etc., the usual procedure is to bevel the edges to be welded for a total angle of 90 degrees, then drill holes, tap and screw in steel studs irregularly over the bevelled surfaces. Beads of steel are then welded around each stud and finally the whole vee is filled in with a successive number of layers in such a manner that the least amount of contraction takes place in the weld.



(LEFT) A CASTING READY TO HAVE THE RISER CUT OFF BY MEANS OF THE CARBON ARC. (RIGHT) THE SAME CASTING AFTER THE RISER HAS BEEN CUT OFF

Electric Welding Is Used Widely

The largest commercial use of arc welding perhaps was first made in steel foundries where defects in steel castings were repaired with the carbon arc. Blow holes and shrinkage cracks are easily and quickly repaired with the arc method at a small cost as compared to the actual cost of the casting. Foundrymen were quick to adapt arc welding to their use.

The railroad industry probably was the next to take up arc welding on a large scale. The chief uses of arc welding the railroad shops are: Welding flues in flue sheets, firebox welding, welding side sheets, tube sheets and door sheets, building up worn surfaces of steel cast-

ings, repairing broken frames and other steel castings, repairing shop tools, building up flanges on driving wheels, and general maintenance of freight and passenger cars. Locomotive companies are using the process in the construction of new fireboxes, thus eliminating all rivets and trouble from leaking seams. The construction cost also is reduced materially.

During the war and since that time the shipbuilding industry has made considerable advance with the arc welding process. Present rules permit the use of welding on a large number of minor parts requiring little strength and also on a few strength members. On such parts as deck stanchions collars, smoke stack pipes, ventilators, skylights, stairs, gratings, tanks, deck houses, etc., welding is approved and a considerable saving is made over riveting. The most important work done by the arc on board ships is the repair of boilers. Owing to the strain placed upon the boilers by the rolling and tossing of a ship, the riveted seams of the shell and firebox develop leaks which are repaired easily with the arc. Corrosion and deterioration takes place rapidly in marine boilers and here the electric arc gives a quick and efficient method of correction. The welding of fire cracks, staybolts, and mud rings also is quite common practice.

Much Material Is Reclaimed

On street railways and interurban lines the arc is found valuable for track maintenance, and general shop repairs on rolling stock. Cupped rails and worn rail crossings are being built up with the arc process in a cheap and satisfactory manner. In the repair shop, many parts are reclaimed such as brake beams, journal boxes, step hangers, bearings, brake shoe heads, etc.

In the manufacturing and industrial field the arc welding process is having a very rapid growth. In the fabrication of steel products of all kinds the arc process generally is cheaper, stronger and better appearing than the old riveting process. In the making of concrete machinery, one of the largest manufacturers recently has changed from a riveted type to an all welded type of steel mixing drum on various sizes of concrete mixers. Also many other parts of the mixer are welded such as levers, chutes, frame work, reinforcing bars, etc. This results in a remarkable saving in labor and machinery and a better product at a reduced cost. It can be stated safely that in any manufactured product made of steel bars, angles, and sheets, that the arc welded will produce at least equal results to the riveted construction at a reduction in cost of 40 to 60 per cent.

Electric welding of pipe lines and storage tanks also has become a common procedure. Low-pressure air, gas or steam pipes, also dredge pipes, can be welded cheaply and satisfactorily with the arc. Only a short time ago a 3,000,000-cubic foot gas holder was erected in Melbourne, Australia, which was 200 feet in diameter and equipped with three telescopic lifts 30 feet high. There was over 20 miles of lap welded seams and only a few pin holes were found after the welding was completed.

Boats Are Built by Welding

In the structural steel for building purposes,, etc., arc welding has not been made use of to any great extent, mainly because of the lack of confidence in the process on the part of architects and engineers. A few structures, ranging from small storage sheds to 40 x

THREE LARGE I-BEAMS WERE WELDED END TO END, THEREBY MAKING A COLUMN. THE DIAMOND PLATES INDICATE WHERE THE WELDS WERE MADE

100 foot buildings have been erected throughout different parts of the country without a single rivet used, all structural members being electrically welded. A 125 x 16 foot cross channel barge, also the 500-ton coastwise vessel FULLAGAR, constructed in England were completely arc welded throughout. Several 40-foot diameter oil storage tanks were constructed in Oklahoma with satisfactory results.

Undoubtedly there is a big future in the structural field for the arc welding process and the building departments of cities soon will recognize this as a standard method of construction, in the same way that reinforced concrete construction is recognized today. It will be recalled that only a few years back, construction by reinforced concrete was regarded as unreliable and would not be passed by building departments. This rejection was due to two reasons which in a way are analagous to the reasons which cause the rejection of the arc welding process, namely, that the strength of the concrete structure depends mostly upon the faithfulness with which specifications are complied with in the construction; and when the job is completed the weakest kind of construction and the worst kind of flaws may be hidden behind a solid surface of concrete. Nevertheless, despite these features, concrete steel construction has made rapid progress, as is illustrated by the large concrete structures we find throughout the large cities. Certainly it is feasible to predict that welding will gain the same pre-eminence if proper methods are used and specifications are complied with, which specifications have been written as the result of practical applications and whose worth has been demonstrated by actual tests.

One of the important problems confronting the boiler code committee of the American Society of Mechanical Engineers, has been the formulation of satisfactory rules governing the welding of unfired pressure vessels, as rules applicable to riveted construction do not always apply to fabrication by welding. Wide differences of opinion prevail among members of the committee, insurance companies, inspectors etc., thus in order to have definite information on which to base their conclusions, the American Bureau of Welding organized a pressure vessel committee which was to run a series of tests on welded vessels. Eight manufacturers co-operated in the manufacture of some 40 tanks to be tested to destruction at the United States bureau of standards, Washington.

Most of the tanks were 6 feet long and 2 feet in diameter and made of mild plate 3/8-inch thick. Electric arc and oxyacetylene welding were used. The hydrostatic test alone was not deemed sufficient so a hammer test was made in addition to the hydrostatic test that is, the pressure was increased in steps and with each increase in pressure a blow of approximately 24 foot-pounds was applied to the welded joint every few inches.

Publish Report of Test

From the data obtained from these tests, the pressure vessel committee of the American Bureau of welding has been enabled to submit a number of important conclusions. It is interesting to note that the hydrostatic and hammer tests showed that the welded pressure vessel has a factor of safety of about 6, according to the formula for working pressure. It is also interesting to note that tanks made with the butt welded joint in the ends, stood up better under test than did the lap welded heads. A complete report of this test was published in the May 1923 issue of the *Journal* of the American Welding Society.

Production of Steel Castings--III

Occurrence, Treatment and Mixtures of Molding Sands Are Described and Outstanding Points of Molding and Cleaning Equipment Touched Upon— Different American Specifications Are Reviewed

BY R. A. BULL

IN ANY general discussion of steel foundry practice reference to the subject of molding sands is advisable. Contrary to the condition in Great Britain, American steel foundries, in the great majority of cases, use synthetic sands. The base of these sands is generally a sand having rounded grains, analyzing, from 94 to 99 per cent silica. Large deposits of such sand are found in numerous locations in the eastern and middle-western states. In the extreme eastern section there has been developed a deposit of sand sufficiently high in silica content, and yet carrying enough natural clay of the desired qualities, to make the sand suitable for some steel molding purposes without the supplementary introduction of any ingredient that nature has not supplied. This deposit is of unusual character as compared with American sands in general. In the extreme west there have been developed practically no sand deposits of consequence well suited to steel foundry operations.

The conditions referred to have necessitated much attention to the design and operation of sand-mixing equipment. Such equipment consists of two general types, one being that of the pan, with revolving mullers or rollers; the other being of the barrel type, horizontally set up, with paddles or blades revolving on a shaft extending the length of the cylinder shell. The pan type of mixer is much the more common one in use. The pan itself is circular, generally varying from 6 to 10 feet in diameter. Sometimes it is held stationary, while at other times it is revolved. In most cases two mullers with intervening plows are employed. These mullers are of varying width, and, as applied, have flat treads unlike some found abroad.

Hoppers Receive Mixtures

Elevating hoppers are now used with pan mills for receiving the ingredients of the sand mixture while a charge is being milled in the pan. As soon as the pan is empty the hopper into which the ingredients have been introduced is mechanically lifted and dumped into the pan for mixing. In some types of mills that have stationary pans, the sand, after mixing, is quickly dumped through an opening in the bottom of the pan, which is closed by a hinged door during the mixing operation. In certain kinds of mills with stationary pans, a section of the pan side is made as a hinged door to serve the same purpose. Where the revolving pan is used, an adjustable plow is often introduced over the side of the pan to deflect the milled sand and empty it over the side.

Milling time in the pan ordinarily consumes not less than 3 nor more than 10 minutes per batch, but is rarely regulated by the clock. In most cases the mill operator regulates the time for the operation by a fist test, or by the apparent strength and moisture of the mixture as his sense of touch permits him to judge.

In most American steel foundries a fairly large percentage of the old or heap sand is used in the regular facing, or sand prepared for ramming directly against the pattern. The portion of such used sand in the facing varies in accordance with the class of work being produced and the ideas the individual foundryman has as to the proper composition of the mixture. His judgment is influenced partly by the delivered cost of new sand, or in other words, by the proximity of his source of supply. Probably the proportion of heap sand used in most American steel foundries for the general run of work produced, ranges from 25 to 50 per cent. Despite this extended use of old sand, more than 50 steel foundries answering a questionnaire recently reported consumptions of new sand that averaged 1400 pounds per net ton of castings produced.

Fireclay is almost universally used for imparting cohesiveness to the mixture intended for facing. There are many clays in use that are quite suitable for his purpose, whose melting point will average 1500 degrees cent. Many clay producers who serve steel foundries, in recent years, have delivered their product in a finely pulverized condition to the great advantage of the steel casting industry. It is generally recognized that a dry binder is most effective when added to the sand in a finely divided condition. Steel foundries frequently add to the facing mixture some farinaceous product, generally made from corn or wheat, which has cohesive value and at the same time is generally believed to impart peeling properties to the face of the mold. An opinion held is that this material goes into rapid combustion when in contact with the molten steel; and that a gaseous envelope is formed by this combustion, which tends to protect the less refractory ingredients in the face of the mold, to the final advantage of the casting from which the sand is believed to strip or peel more readily.

Temper with Molasses Water

To temper the facing in the mold, water alone is added, or water thickened with a small proportion of molasses or a substitute therefor. This substitute is purchased under various trade names and is generally a by-product of the wood pulp indutsry. Its bonding strength is about one and one-half times that of molasses, when used in conjunction with silica sand.

During the last few years a great deal more attention has been given the study of molding sands for all foundry purposes in America than was formerly the case. The most significant development in this study has been the formation of the joint committee on molding sand research, organized by the American Foundrymen's association with the active co-operation of the National Research council, the American Society for Testing Materials and various government bureaus and departments, including the bureau of standards. This committee includes representatives of every phase of industrial and scientific work which is related to the subject. During the last year and one-half the joint committee has been vigorously attacking problems related to the testing of molding sands for the purpose of establishing standardized methods of tests. At this writing, methods for essential tests to determine bonding strength, permeability, and fineness; and methods for supplementary determinations relating to

This is the third and last part of the American exchange paper presented at the convention of the Institute of British Foundrymen held in Birmingham, England, June 13-15. The author is director of research, Electric Steel Founders Research Group, Chicago. The first part of this paper was published on page 248 of the July 26 issue of IRON TRADE REVIEW and the second part on page 314 of the Aug. 2 issue.

dye absorption and complete chemical analysis, are practically ready for tentative adoption for one year's trial throughout the American foundry industry. A comprehensive method of sampling sand also has been prepared. As a result of the joint committee's activity many geological surveys have been planned to develop new deposits of molding sands. One phase of the committee's activity of an important character relates to conservation and reclamation. The author suggests the future scrutiny of British steel foundrymen to the committee's reports presented at the 1923 convention of the American Foundrymen's association.

Equipment Rugged

Description of molding equpiment used at home and abroad either in the form of technical papers or in circular matter disseminated by sellers of such equipment have been sufficiently elaborate to make unnecessary extended mention in this paper. Considering the widely diversified nature of the steel casting industry, the equipment in its various forms represents a large number of devices, many of them highly ingenious and extremely useful. Factors which have been properly regarded by the most intelligent manufacturers of such equipment in the United States are those of ruggedness and ability to stand the excessive wear to which such devices are generally subjected as part of the equipment in a steel foundry. Wherever it has been practicable to displace manual labor and to substitute therefore a squeezer, pneumatic rammer, jar rammer, or other type of machine for compressing the sand, the substitution has been considered and often effected, in the average American steel foundry.

In such foundries specializing in small castings, and shanking the metal by means of pots carried by hand, the squeezer machine is an important piece of equipment. For floor work the pneumatic rammer has demonstrated itself to be of much value in a lessening of manual labor and in great flexibility, applicable irrespective of the nature of pattern equipment or the number of molds to be made from a pattern. The jolt machine, or jar rammer, during the last 15 years has justly become popular. It was developed many years before that but for some time received inadequate recognition. Vibrators to facilitate pattern drawing rollover devices for the more satisfactory and rapid use of molding machines, and other improvements in components of molding equipment, have been developed to a great extent within the last 10 years. More recently other types of molding machines have been patented which are of material assistance not only in ramming but in handling the facing for this operation. Some of these more recently developed items of molding equipment are of special application to the making of castings requiring a considerable flask area, and ordered in large quantities at one time.

Naturally the specialization particularly significant in the basic open-hearth foundry has reflected itself in the engineering skill wisely directed to molding equipment for its classes of duplicate work. So successful have been efforts in this direction that superiority of the castings produced has attended rapidity of production. As a simple economical combination for the production of open-hearth specialties in cast steel, the plain stripping machine permitting the pattern to drop through the plate, and the pneumatic rammer represent very common practice in the United States.

Related directly to the quicker production permitted by machine molding are the delivery of the facing and backing sand to the machine, the delivery of flask equipment to the molders at a speed permitting satisfactory continuous operation of the machine, and conveyance from the molders' working floor, of the molds after finishing and closing. These operations must be satisfactorily synchronized to obtain the full benefit of equipment for rapid molding. It frequently happens that the delivery of sand and flasks to and from the molding floor constitute a problem which requires much more thought and a much larger expenditure of money for equipment than are needed for the operation simply of ramming the sand. The extent to which such production problems have been worked out in some American steel foundries devoted mainly to the manufacture of duplicate work, is highly interesting, and indicative of the fact that mechanical engineering has a large part in the operation of such plants.

Operations Synchronized

In the jobbing steel foundries in the United Stated there necessarily has been less of this development. However, the average foundryman in such plants is alive to the economical advantage of much molding machine equipment at present available to him, by means of which he may displace manual labor to considerable extent in the production of short jobs, or pieces ordered in small quantities at one time.

The development of mechanical devices for molding in the United States has been pronounced during the past 20 years. It has been progressive with each year, but the growth was naturally at an accelerated rate during the world war. It is safe to assume that the design and construction of labor saving equipment for molding purposes in America will continue at a rapid rate for a long time to come, and that we will see 10 years hence a further significant advance, through the application of great engineering skill now directed to the study of foundry problems.

Core Room Backward

The installation of scientific methods characterizing molding operations has not been paralleled by similar progress in the core room, in American steel foundries. The steel casting industry seems to have labored under somewhat the same handicap as has afflicted other branches of the foundry industry in the United States, in inadequate attention given to core practice. Significant exceptions to this rule are of course found where steel and other castings are produced. These indicate to the intelligent observer the present availability of considerable equipment that can be economically employed, for preparing the core sand, for ramming the cores, for baking them, and for storage and transportation.

It may be truthfully said that while the industry as a whole has not paid adequate attention to coremaking, the operation of ramming the sand in the corebox has been developed with reasonable success in the average American steel foundry, simultaneously with considerable neglect in the selection of core sand mixtures and in the baking of the cores.

There is much yet to be done in determining the best materials to employ core mixtures for various classes of work. These include the sand used as a base, and the green binder; and the permeability of the core; the relatively important skin of the core, and the many other considerations involved in baking the cores. There is considerable difference of opinion regarding desirable fuels for core ovens, temperatures to employ, periods of time for drying at designated temperatures, and circulation of heat in, and insulation of core ovens. Some steel foundries have been carrying on extended investigations into this subject with resulting economies in progressive degree.

The average steel foundry in America uses a considerable quantity of silica sand as the base for most of its core mixtures. Some such foundries also employ sands not containing a high silica content, but characterized by a slight amount of cohesiveness due to the presence of a natural clay substance. It is the practice in most plants to use a considerable portion of heap sand in core mixtures not

bonded with oil. Sometimes the refuse from sandblasting is introduced into the core mixtures.

The use of oil as a binder for core sand is observed more in steel foundries making small castings than where large ones are common. The author believes that in the steel casting industry such use of linseed or other oils is proportionately on the decline, due to a growing more careful discrimination in the use only of high priced materials where the need exists; and to the reasonable success that has attended the manufacture of some classes of work where cheaper core binders than oil have been successfully substituted.

Pitch as Core Binder

In the larger steel foundries there is much pulverized pitch used as a core binder, either in its pure form or as mixed with small percentages of other materials in what are called core compounds. For many classes of work, large and small, pitch has indeed proved to be a highly satisfactory core binder, particularly advantageous in use with considerable percentages of heap sand. In that respect it differs widely from oil, whose function as a binder after drying does not satisfactorily come into play when the sand grain has a coating of clay which absorbs much of the oil without any appreciable benefit in temporarily making the sand grains cohere, as when such grains are clean.

The use of wheat flour in American core sands has been of long duration. In recent years other farinaceous products have been employed to considerable extent as substitutes for it. The employment of any of these materials is often advantageous in reducing the amount of clay to give the required green bonding strength. It is becoming recognized more and more that a heavy proportion of clay in a dried core is disadvantageous in certain classes of work. Substituted bonding materials which go wholly or partly into combustion when the metal is poured are being studied with reference to the volatile matter expelled in such combustion, and the effect this may have in causing porosity in the steel casting.

Equipment and methods employed in cleaning steel castings in American steel foundries are widely varied according to the nature of the work produced. They represent a great deal of ingenuity that has been applied to this relatively expensive phase of steel casting manufacture. Since the nineties there has been a tremendous development in the installation of mechanical devices to take the place of hand chipping and other laborious operations that formerly produced high cost and unsightly appearance of the product as shipped.

In the larger foundries the pneumatic hammer is extensively employed. Circular cold saws are frequently used for the removal of heads or risers on large castings. In many open-hearth foundries, pneumatic chipping hammers, cold saws, grinding wheels, sand-blasting apparatus, hydraulic presses for straightening, and welding equipment constitute practically all of the cleaning facilities. Foundries specializing in the manufacture of small steel castings generally have gas torch equipment for burning off gates and heads or risers, swing and stand grinding machines, apparatus for blasting with sand or a metallic substitute, pneumatic chipping hammers, tumbling barrels and welding equipment. Facilities for welding in the industry as a whole include apparatus for performing the operation electrically and by means of gas. Difference of opinion exists regarding the relative effectiveness of gas and arc welding. This is probably due to difference in the skill of operators. The author's experience has indicated the effectiveness of either method of welding in careful, experienced hands when proper equipment is used. Under those circumstances electric welding is the cheaper.

The sequence of cleaning and finishing operations in any foundry is appropriately given serious consideration, and should be decided largely by the nature of the work produced. These operations include the important one of heat treating, which is mentioned later.

The extent to which thorough cleaning methods are applied to steel castings varies perhaps more than any other detail of such manufacture, except melting. However, cleaning requirements, have considerable to do with molding and core practice, which are properly regulated to a large extent by the desired surface appearance of the product. Reference has been previously made to what is in the United States a marked differentiation in the surface finish. This factor has caused a great refinement of cleaning operations to be adopted in many steel foundries specializing in the manufacture of small castings.

Stimulus to Heat Treatment

The world war provided a great stimulus in the heat treatment of steel castings made in the United States, through the exacting physical tests for much ordnance work. Many foundrymen learned much of value regarding the effects of scientific heat treatment. The depression in the industry which was marked in 1921 stimulated some steel foundrymen to improve their heat treatment methods to even greater extent that was done during the war. There is now a great interest in this subject in the industry and among users of steel castings. Researches are being conducted in many plants, and as a result many highly important facts are being established. Among those which have hitherto been misunderstood or practically disregarded, is the effect of the rate of cooling after heating in the annealing oven.

It may be appropriately explained here that engineering phraseology in the United States now classifies under the term heat treatment any method of heating and cooling for the purpose of refining the structure. The word annealing is now used generally to define such heating when it is followed by a cooling operation in the oven. The term normalizing is employed to mean such heating when it is followed by cooling in the air. The term heat treatment as now used does not imply necessarily a secondary heating, and has a general, not a specific interpretation among American metallurgists.

Pyrometers Employed

Ovens used for heat treatment in American foundries are called annealing ovens. In most of these annealing ovens, pyrometers are installed. The fuel used for such ovens is selected according to the location of the plant and the availability of suitable coal, fuel oil, and gas either natural or artificial. The annealing cycle varies tremendously according to the thickness of section. Probably the range is between 6 hours and 9 days. The period last named is employed for the complete operation in the case of cast-steel rolls of diameters up to 48 inches.

An interesting development taking place during the past few years has come to public notice within the past 12 months. This is regarding more exacting requirements for the physical properties of American-made steel castings. For a considerable period up to June, 1922, commercial specifications for the soft grade of carbon steel castings called for the following as minimum tensile-test values:

Ultimate strength per square inch	60,000 pounds
Yield point 45 per cent of ultimate strength	
Elongation in 2 inches	20 per cent
Reduction of area	30 per cent

Minimum values consistent with those enumerated for soft steel were prescribed for medium and hard steels.

Following a well defined desire for more exacting specifications, expressed by consumers of high grade steel castings for railroad use, in which producers of such castings indicated a reasonable

degree of acquiescence, a joint committee was formed to represent the American Society for Testing Materials and the American Railway association. This committee conducted a large number of tests following which it reported to the parent organizations. The result finally was the adoption in June, 1922, by the American Railway association and by the American Society for Testing Materials, of tentative specifications for carbon steel castings for railroad use which call for the following minimum tensile-test values for the annealed soft grade:

Ultimate strength per square inch..not specified
Yield point per square inch.....1,600,000
Tensile strength
Percentage of reduction of area.....2,600,000
Tensile strength

The specifications stipulate that the elongation in 2 inches shall not in any case be under 24 per cent, and that the reduction of area shall in no case be under 35 per cent.

It is significant that minimum values for ultimate strength are not specified, and that the actual tensile strength must be determined, according to these tentative specifications, simply to ascertain by the formulae the minimum figures for elongation and reduction of area. Values intended to be consistent with those for the annealed soft grade referred to in the foregoing were established for one harder grade. The term annealed was embodied in these specifications in place of the better one, heat treated. The tentative adoption of these specifications means their use on trial for one year from such adoption. It is, of course, optional with any consuming member of either association concerned in the formulation of these tentative specifications to purchase railroad steel castings in accordance with these requirements. They will not have the strength back of them in influencing the steel casting industry that will result, if and when satisfactory use of them as tentative has shown the desirability of making them permanent or standard. The elimination of minimum tensile strength values is the result of a growing disposition among railroad engineers who design steel castings, to regard the yield point as of paramount importance, compared with the ultimate strength, in establishing the proper factor of safety.

Tentative adoption of much more exacting requirements for physical properties in steel castings for railroad has naturally had its effect in causing producers and consumers of steel castings for other uses to scrutinize current specifications, with the idea of making them more in conformity with the better results in practice now being obtained, as compared with the results previously secured when the industry was under less scientific control. At the annual meeting of the American Society for Testing Materials to be held in June, 1923, revised specifications for steel castings for general use will be submitted to the Testing society by its committee on steel which has, through a subcommittee, given a great deal of study to this matter during the current year. It is premature to indicate with any exactness what the requirements will probably be after consideration by the entire personnel of the Testing society. The author can safely offer his opinion that the requirements for the soft grade of carbon steel to be tentatively adopted will call for an increase in the percentage of elongation and in that for reduction of area above the figures (22 per cent and 30 per cent respectively) now regulating the purchase of much cast steel for ordinary use; and that for such ordinary use, it will not be considered advisable to eliminate the minimum value for ultimate strength in tensile testing. The probability is that a greater increase proportionately will be required in the value for reduction of area than will be demanded for the elongation.

Make Exhaustive Tests

It may be noted that the term yield point has been used throughout the references to standard and tentative specifications. The joint committee on tests, representing the American Society for Testing Materials and the American Railway association, was confronted by a desire on the part of certain railroad engineers to make the true elastic limit the basis for revised specifications. After the most exhaustive precision and running tests, it was conceded that the present state of the art of testing provides no satisfactory instrument which, when properly used, gives consistent results to determine the true elastic limit of cast steel. Experimenters who have made many tests on steel castings and steel forgings have found a considerable difference in the behavior of the two kinds of steel in this respect. Instruments are manufactured which indicate with satisfaction, the phenomenon that follows strain beyond the true elastic limit of steel as forged. Considered from the standpoint of instruments that have been thus far developed, it may be said that steel as cast has no true elastic limit, although it has a well defined yield point, determined by the drop of the beam of the testing machine, or by the use of dividers.

From preceding paragraphs it may be seen that physical requirements of an exacting nature not only demanded by American industry but are capable of being satisfactorily met in routine operations in American steel foundries. The large representation of steel founders in the organizations whose functions are to formulate specifications makes this point clear.

Specifications which have been in force for some years covering the manufacture of ordinary steel castings have sometimes called for bend test requirements for soft castings. These provide for the bending cold of the specimen through 120 degrees around a pin 1 inch in diameter, without cracking on the outside of the bent portion. The specimen is machined to measure 1 x ½ inch with corners rounded to a radius not over $\frac{1}{16}$ inch. The tentative specifications for carbon steel castings for railroads do not call for a bend test. The general specifications to be submitted for revision to the Testing society by its committee on steel will probably include an optional provision for a bend test, since such a test is strongly favored by a few consumers such as the United States navy. Recently a great deal of study has been given to the subject of bend testing, and it is probable that as a result explicit instructions will be embodied in specifications at some future time regarding the manner in which a bend test shall be made. It has been determined that the manner of making the bend has much to do with the result of the test. Other conditions than those covering the section of the bend piece and the radii of the corners should be imposed.

Specifications for steel castings in use in the United States have included certain requirements as to chemical analysis. The present standard specifications of the American Society for Testing Materials for steel castings call for the following:

	Class A per cent	Class B per cent
Carbon	not over 0.30	.....
Phosphorus, acid	not over 0.07	not over 0.06
Phosphorus, basic	not over 0.06	not over 0.05
Sulphur	.....	not over 0.06

Class A castings as referred to in the specifications mentioned need not be annealed unless so specified, and are intended for purposes justifying no physical requirements. Class B castings are those which are graded according to hard, medium or soft condition for which physical requirements are stipulated. The maximum limitation for phosphorus and sulphur mentioned in the table may be exceeded, according to the terms of the specifications referred to, by not more than 20 per cent.

The tentative specifications for carbon steel castings for railroads adopted

(*Concluded on Page* 392)

History Indicates Forging Was Ancient Art—II

BY FRANK SOMERS

WITH the introduction of the reverberatory furnace by Thomas and George Cranege in 1766 and the puddling process by Cort in 1784, a great impetus was given to the manufacture of wrought iron. Pigs were heated in a reverberatory furnace and puddled into balls. The balls were brought out of the furnace and hammered into bars, which were then termed puddled bars. These were cut up into suitable lengths, built up into a pile on a board, heated in a furnace, and shingled under a hammer into a bloom, the bloom afterward being rolled or hammered into a bar.

Whether making an iron forging from scrap iron or new bar iron similar methods of manufacture were adopted. In the former, scrap iron was sheared into suitable lengths and carefully piled up on a board until the required weight was reached. In the latter, new bar iron was sheared into short lengths which were cross piled, the alternate layers being at right angles to one another. Piles which weighed from 30 to 200 pounds were charged on a peel into a furnace, heated to a welding heat, brought out at this stage by means of a pair of tongs, placed under a hammer and welded into a bloom, which could be flattened down into a slab if required.

Limitations of Tilt Hammer

While the tilt hammer could make small forgings satisfactorily it was an inefficient tool when dealing with large pieces. The upper tool when raised or tilted moved in an arc, and therefore could not strike even blows on varying thicknesses of metal, the metal being subjected to greater pressure toward the pivoted end of the helve. When a large piece which required heavier blows was placed on the anvil, it received lighter blows, owing to the fact that the piece occupied nearly all the space in which the hammer moved.

In 1837 Mr. Humphries, then engineer of the Great Western Steamship Co., went to consult with Mr. Nasmyth regarding the equipment and tools required for constructing the engines of the then proposed steamship GREAT BRITAIN. The engines actually were being made when a difficulty arose in respect to the then enormous size of the proposed paddle shaft. On Nov. 24, 1838, Mr. Humphries wrote to Mr. Nasmyth as follows: "I find there is not a forge hammer in England or Scotland powerful enough to forge the paddle shaft for the engines of the GREAT BRITAIN."

Nasmyth investigated and finding the design of the tilt hammer was incorrect for making large forgings, he sketched a design of the present-day steam hammer, and the same day dispatched a sketch to Mr. Humphries showing how he proposed to forge the paddle shaft for the GREAT BRITAIN.

Owing to the fact that screw propulsion of vessels was attracting much attention at this time, the design of the paddle shaft was scrapped and for a time Mr. Nasmyth's steam hammer was not required. His sketch of the steam hammer reproduced as Fig. 14,

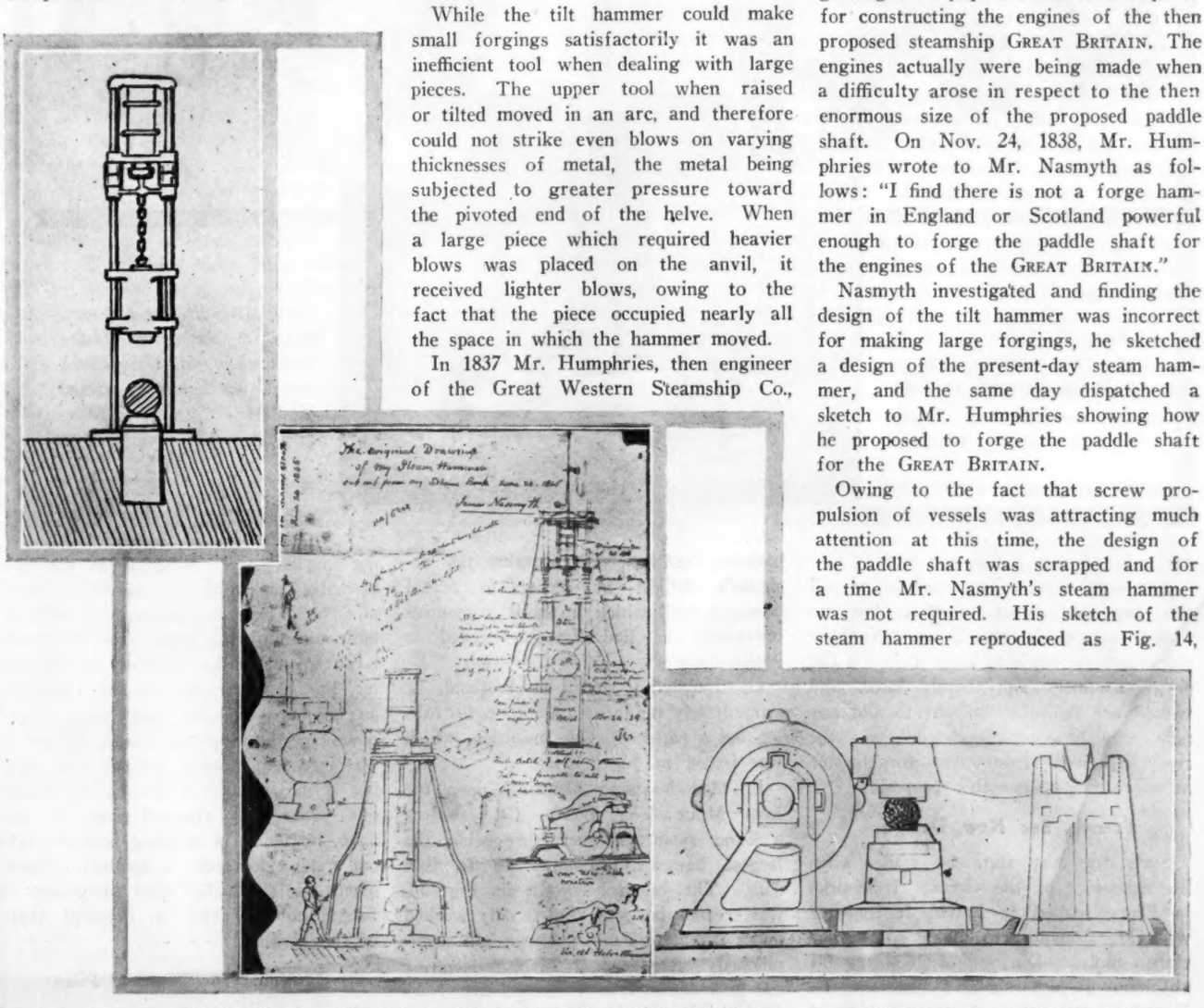


FIG. 12—NASMYTH'S SKETCH OF HIS FIRST IDEA OF A STEAM HAMMER. FIG. 13—DRAWING OF STEAM HAMMER REPRODUCED FROM SMILES' "NASMYTH". FIG. 14—A FORGE HAMMER IN THE DOWLAIS IRON-WORKS. FROM TRURANS' BOOK ON "MANUFACTURE OF IRON" (1862)

Steel Era Brings New Life to Industry

IN THE accompanying article, Mr. Somers shows how the work of the Martin brothers, Siemens, Bessemer and others, coupled with James Nasmyth's invention of the steam hammer, gave impetus to the forging of steel in the nineteenth century. The third installment, which will appear next week, covers the introduction and development of forging presses.

The series, of which this article is the second installment, is from a paper read before the Birmingham branch of the British Institution of Mechanical Engineers, Feb. 8, 1923. The author is joint managing director, Walter Somers, Ltd., Halesowen, England.

evidently was based on the then existing pile driver, as in a letter to W. Morgan dated Nov. 27, 1839, he refers to his system as follows: "What we want in a heavy hammer is a heavy blow, and that it be given at all times and in all cases parallel with the anvil block, and that we should have it of variable power as the case may require, the power of course of stopping or going on, and quickening or slowing the rate at will. My system is to employ the power of steam by direct action to lift up the hammer, which I would have a heavy block, like a pile driving machine, steam being applied to the under side of the piston rod * * *"

Although the designer wrote to all the important firms of that day, no forgemaster would take it up. "We have not orders enough to keep at work the forge hammers we already have, and we do not desire at present to add any new ones however improved," was the reply received from one forgemaster after reading Nasmyth's proposal.

French See New Design

Such was the state of trade when M. Schneider of the Creusot Ironworks in France called at Patricroft together with M. Bourdon to order some machine tools. During Mr. Nasmyth's absence, a Mr. Gaskell showed the French visitors through the works and also took the opportunity of showing them Mr. Nasmyth's sketch or scheme book, in which was the design of the steam hammer which no English firm would adopt at that time.

Large Hammer Built

In April, 1842, Mr. Nasmyth went to France to visit Messrs. Schneiders works and while being shown the plant by M. Bourdon, remarked upon the large size of a crankshaft forging he saw, and asked by what method it was made. Mr. Nasmyth, who was unaware that his sketch had been seen by M. Bourdon, was amazed when M. Bourdon replied, "Under your hammer." M. Bourdon then took Mr. Nasmyth to see the steam hammer, and one can imagine the designer's delight at seeing in actual work, a tool, which up until a moment previously, he had thought existed in design only.

On Nasmyth's return to England, he immediately made arrangements for taking out a patent for his invention, which was issued in June, 1842.

In 1844 Nasmyth prevailed upon the Low Moor Iron Works Co., to try a 4-ton steam hammer, this being the largest hammer attempted up to that date. The hammer shown in Fig. 16, was erected, but was at first only worked under great difficulties owing to complicated valve gear. Mr. Wilson of the Low Moor Works assisted Mr. Nasmyth in introducing a new simple contrivance for working the hammer. The difficulties thus were overcome and by the new arrangement, any length of stroke, heavy or light blows could all be regulated by means of a single operating lever.

Due to the introduction of the steam hammer, forgings were no longer limited to small sizes, the limiting factor up to the time of the introduction of steel, being the difficulty in handling large iron piles under the hammer. To facilitate the handling of heavy pieces under the hammer, swinging jib cranes were installed, with hand worked winches for raising or lowering the load.

The method of making a large iron forging was almost the reverse of making one in steel Whereas in the former the blacksmith started with a small unit, and by the process of addition, built up until the piece was sufficiently large to make the forging, in the latter the process was one of reduction, an ingot of sufficient size being forged down to the required shape. Where it was intended to make a large iron forging, a pile of iron consisting of numerous slabs was charged into a furnace, heated to a welding heat, brought out and welded under a hammer. Subsequent heats usually were necessary to forge the pile into the required shape of the forging.

Methods for Making Piles

Several methods have been employed for making piles two of the best known being roughly described as follows: In

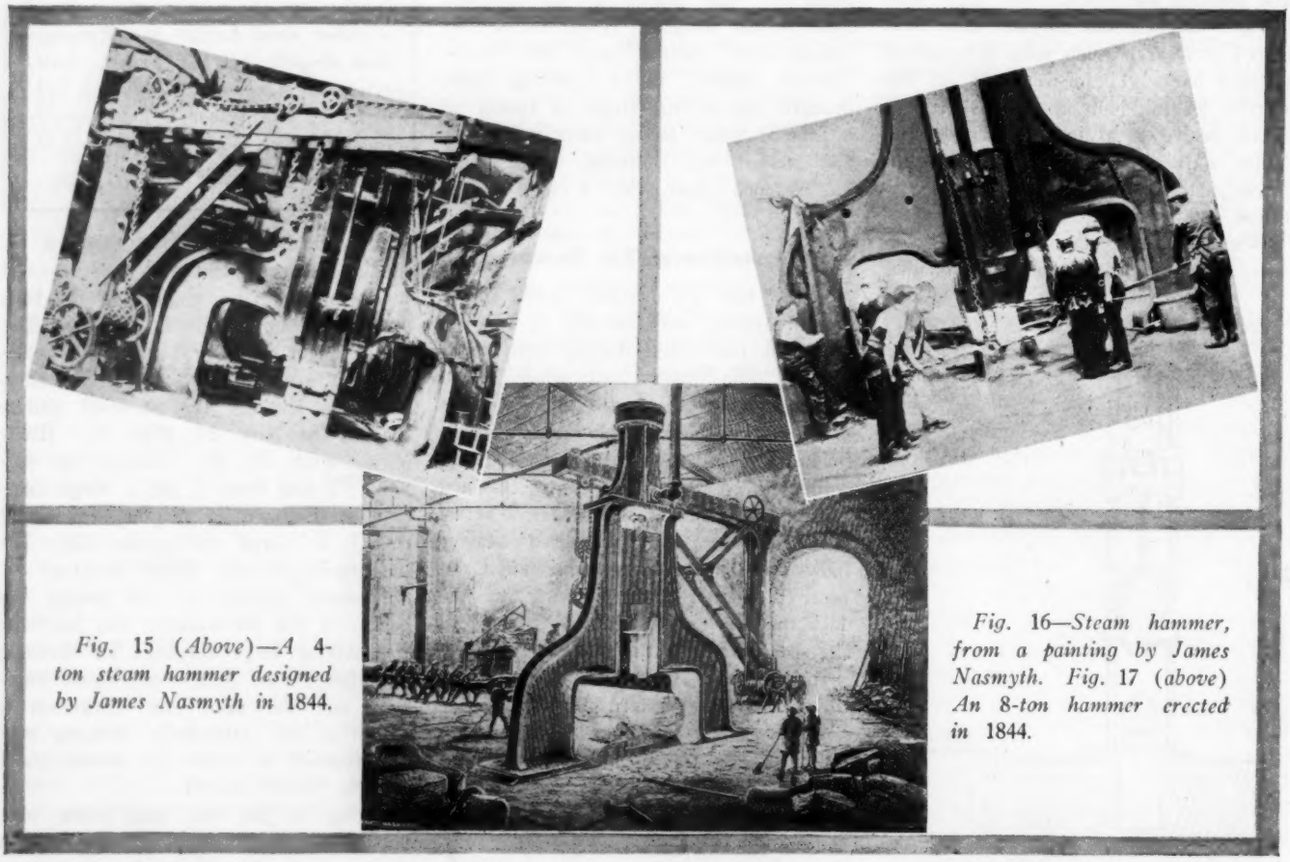
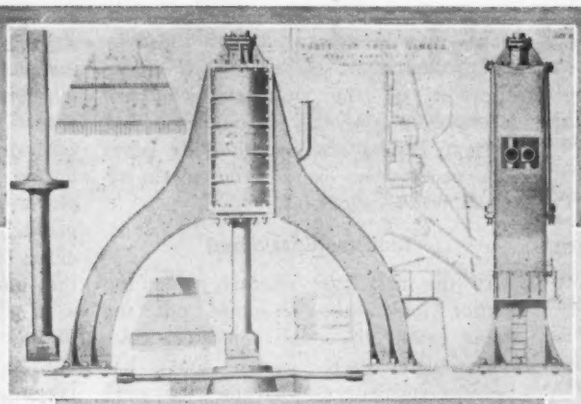


Fig. 15 (*Above*)—*A* 4-*ton steam hammer designed by James Nasmyth in* 1844.

Fig. 16—*Steam hammer, from a painting by James Nasmyth. Fig.* 17 (*above*) *An* 8-*ton hammer erected in* 1844.

Fig. 18 (*Below*) *Hammer at Atlas works, Sheffield. Fig.* 19 (*Right*) *A* 40-*ton hammer of early design.*



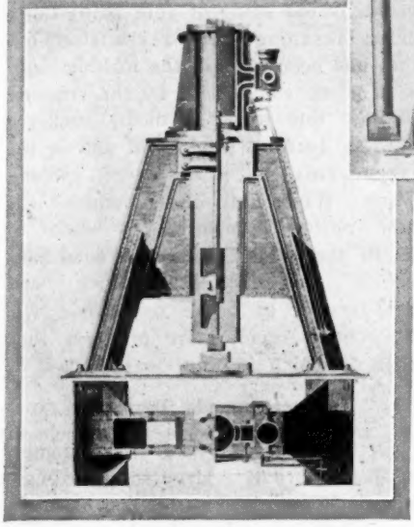
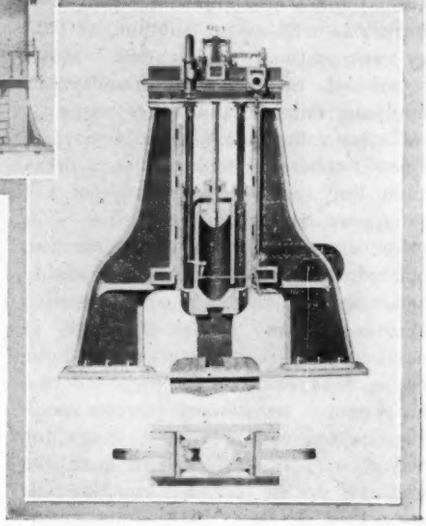


Fig 20. (*Below*) *Plan and elevation of a hammer built for a Glasgow works.*



making an iron pile by the *"building on staff process,"* a staff made of iron of similar quality, to that of the slabs which were to be welded to it, had one end flattened down until it was sufficiently wide enough to make the required forging. Slabs were placed one on the top of the other on this flattened end until the required weight was reached. Then these slabs were thinned down on the end which was welded on to the circular portion of the staff. To ensure all surfaces being heated up uniformly so as to make sound welds, small pieces of iron were inserted in between each slab, allowing the flame to get to all surfaces. After being charged into a furnace and brought up to a welding heat, the pile was withdrawn and welded in the usual manner.

Another method of making an iron pile was to use plain rectangular slabs for the top and bottom of the pile, and slabs with "V" pieces cut out for the middle of the pile. An iron staff having an end shaped to fit the "V" recess in the pile was heated simultaneously with the pile in an adjoining furnace. When both pile and staff were at a welding temperature, the staff was withdrawn from the furnace and the "V" end was driven into the corresponding recess in the pile. The staff and slabs sticking together enabled the iron pile to be carried out by a jib crane and placed under a steam hammer where the whole mass was welded into a bloom. After being reheated the bloom was drawn down under a steam hammer into the shape of the required forging. Should the forging be heavier than a bloom which could be handled satisfactorily under a hammer then the process of "laying on" was employed.

As iron forgings increased in size, so did the difficulties in making them, perfectly sound. Considering the hundreds of welds required in making an iron forging, and realizing that one faulty weld would spoil the finished forging, it was a real accomplishment to make a large iron forging that was sound.

With the introduction of the bessemer process for making steel, experiments were made to determine the relative values of iron and steel for forging purposes. Closely following the introduction of the bessemer process came the Siemens Martin process, and therefore from 1868 steel became a competitor of iron for making forgings. Today, except in certain cases where corrosion is the most important factor, steel is used almost exclusively in forging.

As heavier steel ingots were made, steam hammers originally using steam only on the underside of piston (single acting) were made double acting. This

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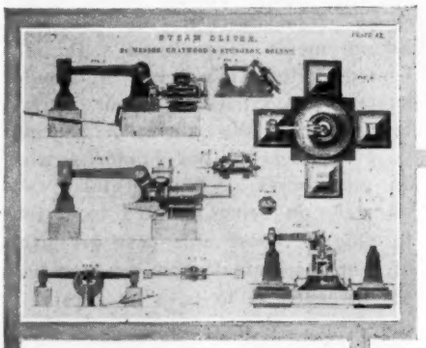
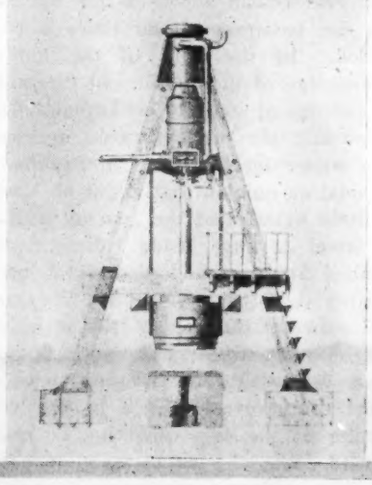


Fig. 21 (*Above*) *Details of "Steam Oliver" introduced for heavy work in an English forge shop.*



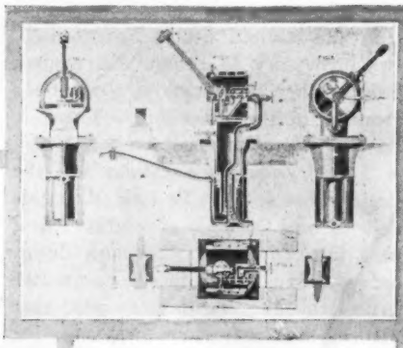


Fig. 22 (*Left*) *A drop stamp hammer designed by Arbel. Fig.* 23 (*Above*) *"Steam Striker" designed by .D. Davis.*

Production of Castings from Steel

(*Concluded from Page* 388)

in June, 1922, call for a maximum limit in manganese content of 0.85 per cent for either grade covered by the specifications; and a maximum limit for phosphorus, as well as for sulphur, of 0.05 per cent, without qualification. Most, if not all, of the steel foundrymen supplying railroad and other castings, and some railroad engineers, believe it is unscientific to establish such a maximum limit as has been imposed for manganese content. The author is in entire agreement with the objection, founded, as he believes it is, on reliable metallurgical data and comprehensive reports on many steels in service. It seems unlikely that any maximum limit for manganese will be proposed for the expected revision of current specifications for carbon steel castings for general use, at the convention of the American Society for Testing Materials to be held in June, 1923, since an increasing and large number of metallurgists and engineers associated with producers and consumers of steel castings feel that the manufacturer should be permitted to regulate the chemical composition of metal, when called upon to meet definite physical requirements. This opinion prevails with natural exceptions regarding the elements of phosphorus and sulphur, each of which occupies a different position in the influence exerted on the physical properties.

Close Co-operation

Since the specifications adopted by the American Society for Testing Materials are the basis upon which practically all consumers' specifications in use in the United States are formed, it is unnecessary to enumerate requirements in other specifications than those mentioned in the preceding. There is a close co-operation between the American Foundrymen's association and the American Society for Testing Materials which brings the organization first named into conference, through designated representatives, in all committee activities of the Testing society that relate in any important way to the foundry business. The friendliest feeling exists between these two important organizations which have a combined membership of more than 4500 men prominent in the manufacture or testing of engineering materials.

Instead of praising the quality of metal in steel castings produced in the United States, the author prefers to submit the facts already mentioned indicating the requirements exacted by engineering practice in our industry. These requirements may be compared with those in other countries to the relative credit or discredit of the industry wherever located, on the fair assumption that average results obtained in daily practice necessarily exceed the minimum requirements called for.

Industry Specialized

In the first part of this paper the author took care to point out the great extent to which the steel casting industry in the United States has become specialized. That fact can only be realized satisfactorily by visiting a large number of steel foundries in a wisely selected, broad area of territory. Perhaps some appreciation of this condition will be gained from the brief mention of many details of practice in previous pages. It is hoped that an erroneous impression may not prevail in some foreign countries regarding effects of what you term *mass production* and what we call *quantity production.* The author, as a regular reader of British literature treating of the steel casting industry, noticed with much interest some months ago, a series of articles in one of your publications by an American friend who endeavored to explain for your better understanding, what is really the result on the product, of quantity production in properly regulated foundries in the United States. The exposition was made by one who is well informed regarding American foundry practice and who, if one may judge from the nature of his occupation during several recent years, should be fairly familiar with foundry practice in the British Empire and on the continent of Europe. His opportunities for making current comparisons should outweight his national prejudices. The opportunities the writer of this paper has had for similar comparisons have been quite limited, but have included examination of numerous foreign-made steel castings during the world war. Reasonable allowance for inferiority due to stress of war times is conceded. In the light of the limited knowledge of the author and the much knowledge of many of his acquaintances regarding the product made overseas, the writer feels justified in cautioning against an opinion that might be inadequately based, that the general average of steel castings made either in the United States or in Canada is of lower quality than that representing the product either of the British Isles or of the European continent. The author's purpose in saying this, is in no sense to start a controversy which by the very nature of the case could not be easily settled, if at all; but to assist, if possible, in the most satisfactory interchange of helpful views based on experience, and on sound hypothesis as to existing conditions at home and abroad. There is much that each of us can learn from the other when mutual respects for genuine accomplishment exists. We in America can profit by the study of your painstaking detail, resulting from a craftsmanship that has been long in the making. You as a group can benefit by the scrutiny of our time-saving methods, employed both in quantity production and in the manufacture of short order jobbing work. When both of us combine the best methods employed by each of us to the extent that local conditions permit, the English speaking steel foundryman at home or abroad will have made much more progress than that of which he can boast today.

Recommends Book

Perhaps every writer who attempts to discuss briefly a large subject always approaches the end of his task with the uncomfortable feeling that his treatment of many details may be out of proportion with their actual significance. Whether or not this feeling generally exists, the author of this paper confesses to the sensation mentioned. If his effort to enlighten his fellow foundrymen abroad should stimulate them to the study of a more complete and far more astisfactory exposition of steel foundry practice in the United States, he would recommend for careful examinaton, an instructive volume devoted to the subject "The Steel Foundry" by John Howe Hall.

The writer wishes to assure his fellow members of the Institution of British Foundrymen of the hearty cooperative spirit toward them, of his closer associates in the American Foundrymen's association. In the United States we watch with genuine interest and satisfaction your increasing growth. We cordially welcome your members to our foundries when on our shores. We congratulate you sincerely on being directed from time to time by those able past presidents of your Institution whom we have been so fortunate as to have as guests. In the future we hope to know many of their successors and colleagues, and to aid and be aided by all of you in the most economical manufacture of the best steel castings that can be produced.

Announcement has been made that Tropenas Co., engineers, 25 Broadway, New York, has been awarded the gold medal for its exhibition at the centennial exposition being held at Rio de Janerio, Brazil.

Adopts New Soaking Pit Design

Wisconsin Steel Works Builds Modern Plant at South Chicago, Ill.—Gas and Air Are Reversed by Six-Way Reversing Valves Which Are Operated Simultaneously by a Control Mechanism—Considerable Space Is Saved

OPEN-HEARTH furnaces and soaking pits are similar in design and function. Although the soaking pit was introduced some time before the open-hearth found general use, its design has been altered or improved little during the last 20 years, while open-hearth construction has witnessed remarkable progress. That the efficiency and operation of the open-hearth furnace is considerably advanced unquestionably is due to the fact that the attention of steel plant engineers has been centered upon it constantly. Moreover, open-hearths are operated under the direct care of a superintendent who devotes his entire time to that work while the operation of the soaking pits usually is under the direction of the blooming mill superintendent, who, with his other duties does not give this equipment sufficient study and attention.

Inasmuch as blooming mill capacity sometimes is limited by the ability of soaking pits to heat the ingots properly, these heating units are of major importance. A common type of construction is shown in Fig. 1. The pits are in a line perpendicular to the chariot tracks, thus it is apparent that it is necessary either to carry the ingots over the covers of the adjacent pits and over the mechanism for operating the covers, or to carry the ingot around, which not only increases the time of operation, but also greatly increases the travel and consequently the wear of the crane bridge. The chariot tracks for the ingots going to the blooming mill and the tracks for the oncoming ingots are on opposite sides of the pit. Another objection to this arrangement is that it necessitates the use of 16 individual regulating valves positioned in the flues under ground for controlling the air and gas in a four-hole pit.

When the reversing valves of a pit are reversed, it is not customary to reset these regulating valves. The passages to the stack are contracted to the same size as are the incoming passages, therefore, on account of the outgoing gases being so much hotter than the ingoing gases, the holes really are regulated by regulating the outgoing gases and not by regulating the ingoing gases. The use of these regulating valves add much to the cost of the pit and also complicates

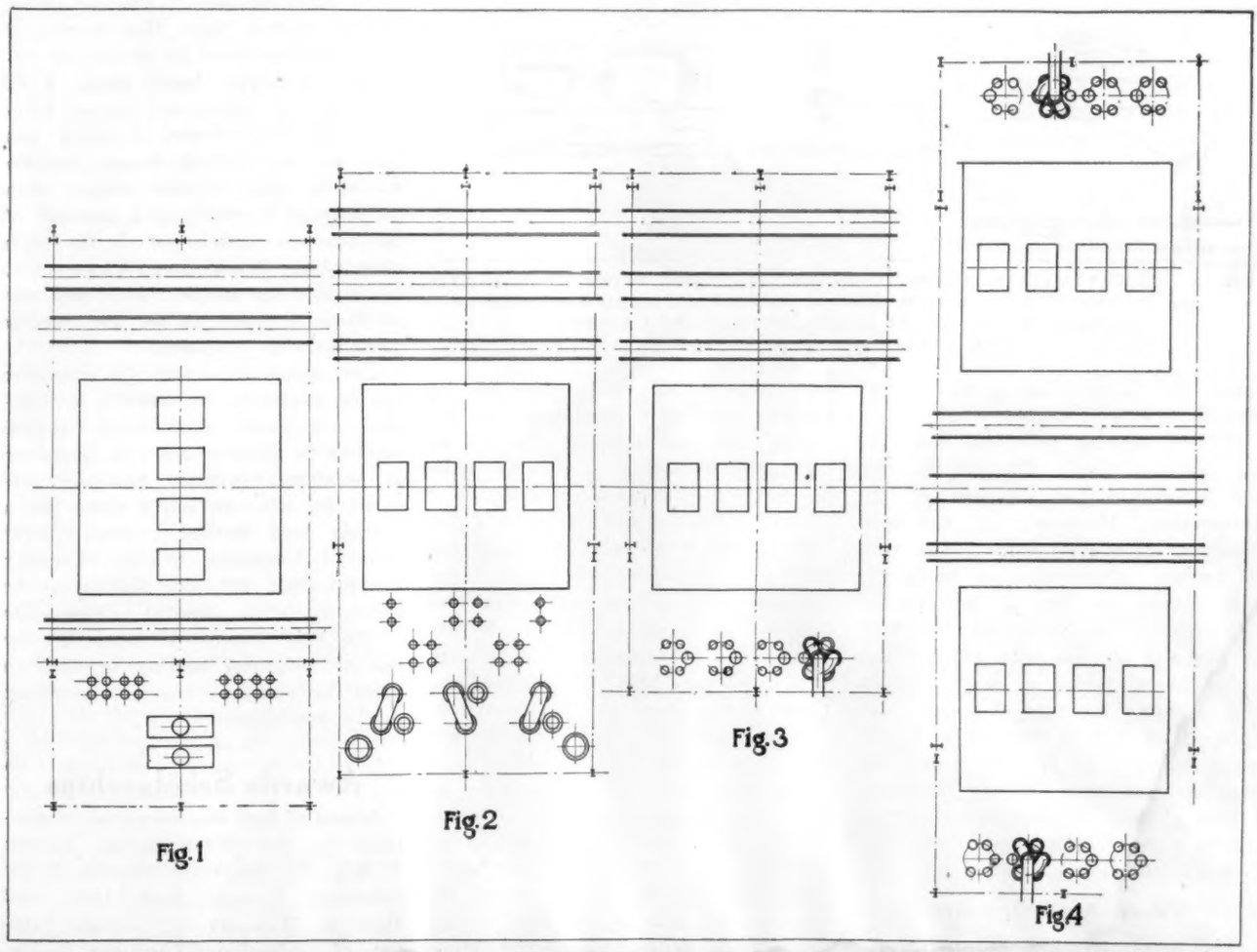


FIG. 1—A SKETCH SHOWING A COMMON TYPE OF SOAKING PIT CONSTRUCTION. FIG. 2—IN THIS DESIGN THE CHARGING HOLES ARE PARALLEL TO THE CHARIOT TRACKS AND SOME SPACE IS SAVED. FIG. 3—THE TYPE OF PITS BEING BUILT BY THE WISCONSIN STEEL WORKS OF THE INTERNATIONAL HARVESTER CO., SOUTH CHICAGO, ILL. A SIX-WAY REVERSING VALVE IS USED. FIG. 4—USING THE SAME PIT CONSTRUCTION SHOWN IN FIG. 3, THE UNITS MAY BE PLACED ON BOTH SIDES OF THE TRACKS, CRANE TRAVEL THEREBY IS REDUCED

greatly the general design of the furnace.

The next step in improved soaking pit design was the construction shown in Fig. 2. The chariot tracks for the ingots going to the blooming mill and the tracks for the oncoming ingots are on the same side of the pits and the holes are in a line parallel to the tracks. The ingot can be carried from any place on the tracks to the pits by the shortest route without crossing another hole or without passing over any machinery. With this design the span of the crane is decreased considerably and the total width of the building is shortened by the elimination of the regulating valves and on account of the simplified design and decreased

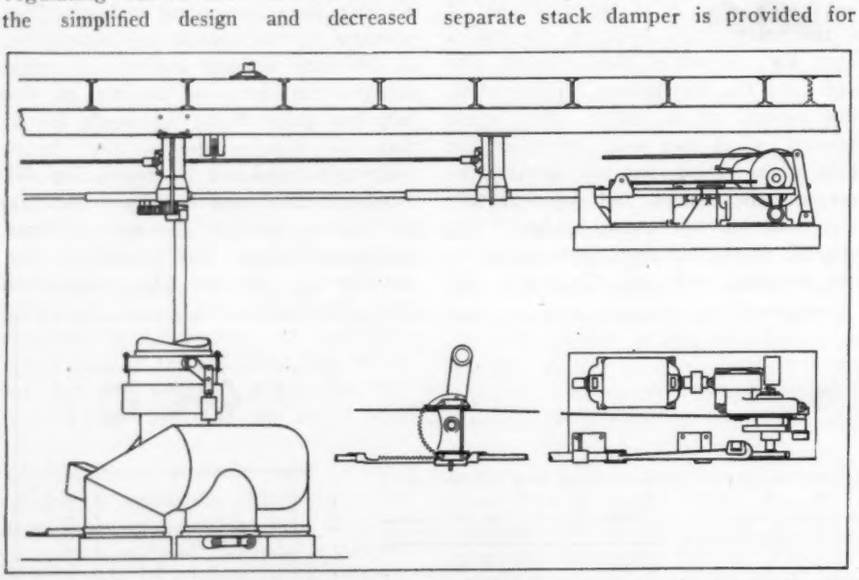


FIG. 5—SIX-WAY VALVES ARE USED TO REVERSE THE FLOW OF GAS AND AIR IN THE PITS. A MOTOR AND REVERSING MECHANISM PLACED UNDER THE PLATFORM RAISE, REVERSE AND LOWER THE VALVES SIMULTANEOUSLY

space, the construction is less expensive than other furnaces.

A new soaking pit plant now being built at South Chicago, Ill., by the Wisconsin Steel Works of the International Harvester Co., has been designed along new lines. The type of furnace construction is similar to that shown in Fig. 2, however, a new method for reversing the flow of gas and air has been adopted and an additional saving of space effected. Fig. 3 shows the type of construction used. Each hole is reversed by a separate six-way type of valve which was described on page 1669 of the June 7 issue of IRON TRADE REVIEW. These valves were designed by Willis McKee, Cleveland.

Values Are Interlocked

The four valves required to reverse one pit are operated by one reversing mechanism. The tubes of the valves are lined with insulating brick so as to decrease the heat losses to a minimum. Fig. 5 shows the design of these valves and the method of reversal. The motor and reversing mechanism are placed under the platform and raise, reverse, and lower the four valves in exactly the same manner as the individual valve described in the June 7 issue of IRON TRADE REVIEW. Each hole in each pit has its separate valve and each valve has its own gas regulating and shut-off valve and two air regulating stands. The valve is so designed that the regulating of the incoming air in each end of each hole is separate from that of the opposite end, thus the outlets are not contracted and a clear passage to the stack always can be obtained. A separate stack damper is provided for each hole. Also each valve has its separate lever for regulating the incoming gas and these levers are so interlocked that they must all be shut before the valves can be reversed.

One of the features of the new design is that when used in connection with a mill capable of rolling large tonnages, the arrangement can be modified as shown in Fig. 4. A row of pits has been placed on each side of the tracks. This will decrease the travel of the chariot by approximately half and will make it possible to get the ingot to the mill in less time. Using this design, it is possible to build any number of pits desired. Previously it has been necessary to build the holes in units of four each.

Features of the new type of pit construction may be summed up as simplicity of design, decreased building requirement, easier service on the crane, a shorter crane span, more rapid handling of ingots, elimination of individual control valves, elimination of the contraction of the path of the outgoing gases, elimination of all valve parts under ground, and the ability to build any desired number of pits. These pits were designed by William Forrstrom, chief engineer, Wisconsin Steel works, under the direction of George Rose, general superintendent.

Forging Was Ancient Art

(*Concluded from Page* 391)

alteration enabled a heavier blow to be struck, due to the increased velocity of the descending hammer, through admitting steam on to the top side of the piston. Moreover, hydraulic and steam operated jib cranes were used in place of hand worked winches to handle the heavier weights permitted by the improved forging equipment.

Extend Use of Industrial Electric Heating

Plans are under way for further promoting the application of electricity to industrial heating in England, where at the present time this source of power has not been as extensively developed as in the United States. J. H. Crossley, Metropolitan-Vickers Electrical Co., Manchester, England, has been in the United States recently making a study of this subject, with the idea of electrifying a number of the producer gas ovens in the main plant of the Metropolitan-Vickers Co., to be used for demonstration and test purposes as well as for the regular manufacturing purposes.

The possibilities for the extensive use of electricity for heating in England are good, since many central stations at present are not operating at maximum capacity and are prepared to offer attractive rates for a heating load having a high power factor. According to Mr. Crossley the principal difficulty that must be overcome is the natural conservatism of the Englishman. However, by the use of industrial heating in its own plant this company hopes to overcome this conservatism.

Awards Scholarships

Award of four war memorial scholarships by the Westinghouse Electric & Mfg. Co. was made recently to the following: George Earl Doty and Paul M. Williams to Carnegie Institute of Technology; Lawrence B. Biebel, to University of Pittsburgh; and Lee P. Doyle, to Ohio State university. Each scholarship pays $500 a year for a period not exceeding four years.

Studies Use of Gases in Reducing Iron Oxide

The factors that determine the efficiency of reduction of iron oxides by gaseous reducing agents may be considered in two classes; those which affect the equilibrium between the reacting substances and their products, and those which affect the rate of reaction, states E. D. Eastman, associate physical chemist of the department of the interior, in Bulletin 2485, just issued by the bureau of mines. Both sets are of practical importance, the former as influencing the maximum possible efficiency and the latter as determining what fraction of the maximum yield may be readily or profitably obtained. In addition, the thermal changes attending the reduction greatly affect the chance of successful industrial application of any such process, and knowledge of them is necessary for the intelligent design of apparatus and control of the reaction. Some aspects of each of these three divisions of the problem are discussed in the bulletin, the gases specially considered being coal gas, water gas and producer gas.

Car Loading Again Sets New High Record

Washington, Aug. 7.—When the railroads loaded 1,028,927 carloads of freight in the week ended July 21 they set a new high record, topping the previous record of the week ended June 30 by some 7000 cars. At the same time the railroads piled up a net surplus of 72,100 serviceable freight cars. In the week ended July 21 loading of ore totaled 84,307 cars, 4991 more than in the preceding week and 19,568 cars more than in the corresponding week of 1922. Coke loading aggregated 14,888 cars, a gain of 373 over the week before and 4950 over the same week of last year.

On July 15 the railroads had the fewest number of freight cars needing repair since December, 1920. The total in bad order was 188,621 or 8.3 per cent of the number on line. In the first half of July the railroads put into service 8217 new freight cars, making 87,457 added since Jan. 1. In the same period 102 new locomotives were placed in service, or 2100 since Jan. 1.

Rate of Coke Output Is Unchanged

Washington, Aug. 6.—The rate of production of beehive coke showed virtually no change in the week ended July 28 and remains about 10 per cent below the June level, according to the geological survey. Preliminary estimates based on the number of cars loaded on the principle coke-carrying railroads place the total for the week at 361,000 net tons against 360,000 in the week preceding. The comparative weekly record follows:

	Week ended July 28, 1923	July 21, 1923	July 29, 1922
Pennsylvania and Ohio	291,000	292,000	82,000
West Virginia	23,000	21,000	6,000
Alabama, Kentucky Tennessee and Georgia	20,000	19,000	8,000
Virginia	14,000	15,000	5,000
Colorado and New Mexico	6,000	6,000	6,000
Washington and Utah	7,000	7,000	4,000
United States total	361,000	360,000	111,000
Daily average	60,000	60,000	19,000

The rate of production of soft coal during July increased gradually from about 10,500,000 tons weekly to 10,800,000 tons. For the week ended Aug. 4, preliminary estimates place the output at 10,900,000 tons.

Furnace Company Formed

Incorporation of the Central Furnace Co., Massillon, O., has been effected under the laws of Ohio. The company is being organized in connection with the plans of the Central Steel Co., Massillon, to build a blast furnace and auxiliary plants at Massillon. Incorporators of the new company are R. E. Bebb, F. G. Griffiths, C. E. Stuart, B. F. Fairless, J. F Schlendorf and C. G. Herbruck.

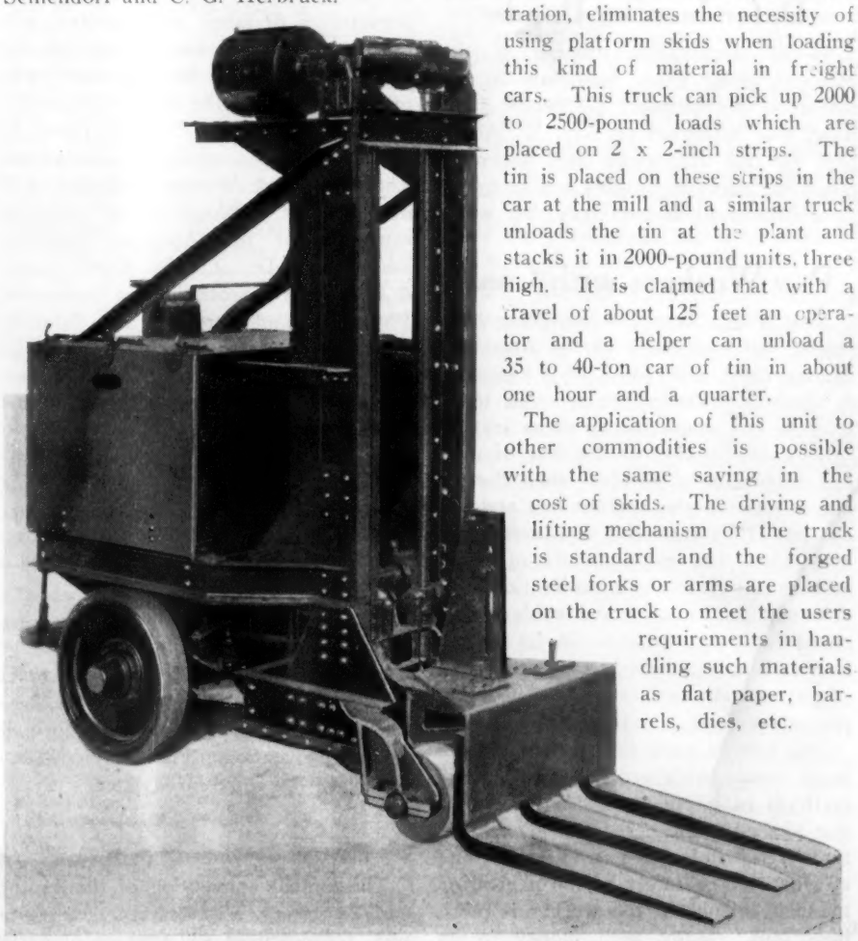
Skyscraper To Use Metal Sash and Frames

Metal window sash and frames will be used throughout in the new 32-story office building being erected by S. W. Straus & Co. on Michigan avenue, Chicago. This will be the tallest building on Michigan avenue. The decision to use metal instead of wood construction in the sash and frames was reached following a number of tests. The tests indicated that with metal construction 3.6 square feet of glass could be added to each window thereby increasing the amount of daylight throughout the building. As each typical suite will have two outside windows, the amount of additional glass will be more that 7 square feet per suite, which will afford 10 per cent more daylight.

Introduces Handling and Stacking Truck

To facilitate the loading of such material as sheet tin at the mill and the unloading and storing at the factory, the Lakewood Engineering Co., Cleveland, recently has introduced a new model lift truck. The truck, which is shown in the accompanying illustration, eliminates the necessity of using platform skids when loading this kind of material in freight cars. This truck can pick up 2000 to 2500-pound loads which are placed on 2 x 2-inch strips. The tin is placed on these strips in the car at the mill and a similar truck unloads the tin at the plant and stacks it in 2000-pound units, three high. It is claimed that with a travel of about 125 feet an operator and a helper can unload a 35 to 40-ton car of tin in about one hour and a quarter.

The application of this unit to other commodities is possible with the same saving in the cost of skids. The driving and lifting mechanism of the truck is standard and the forged steel forks or arms are placed on the truck to meet the users requirements in handling such materials as flat paper, barrels, dies, etc.



LIFT TRUCK WHICH CAN PICK UP 2000 TO 2500-POUND LOADS

India Gets $300,000,000 To Equip Railways

European Staff Correspondence

London, July 27.—The British parliament has authorized a loan of £65,000,000 ($300,000,000) to the government of India for railway construction and development. American builders of railway equipment will have an opportunity to participate in this business. An effort was made to include a provision that the proceeds of the loan must be spent in Great Britain. After considerable debate, the amendment covering this proposition was lost, and the government of India will be free to spend the money in any market it chooses.

The effort to restrict the buying to Great Britain arose from the fact that the government of India had previously announced that it would buy the proposed equipment in the "cheapest market consistent with quality and delivery." The government has been following this policy for some time, as a result of which considerable American iron and steel, and engineering products have been purchased in the past year, although over 90 per cent of the money spent by India for supplies of this character sill finds its way to English manufacturers.

Defer Issuing Bonds

Special stockholders meeting of the Wheeling Steel Corp., held July 30 for action on the proposed $75,000,000 bond issue, was adjourned to Aug. 9. Attorneys for the corporation had not completed the necessary papers and requested an additional 10 days to finish the work.

Pay Workers with Cash

New York, Aug. 7.—According to a report just completed by the American Management association it is extremely doubtful whether the growing tendency to pay employes by check instead of in cash, because of the fear of payroll robberies, is justified when the relation between the amount lost and the amount safely carried is considered, and also when the requirements of wage earners are given the consideration they deserve. Information and evidence secured by the association in its survey lean strongly toward a continuation of payment in cash, especially for employes receiving less than $2000 a year.

The survey took into consideration every angle with regard to the two methods of payment, and in weighing one against the other, report concludes that "The whole question is largely one of whether the safety of the payroll or the convenience of the worker is more important." Many need money in its most immediately negotiable form," the report states. Foreign born workers would not understand and would greatly object to any other form of payment than in cash. The temptation to spend is only postponed, or slightly reduced in case of check payment."

News of Societies

Past and Coming Meetings of National and Local Trade and Technical Organizations

SIXTY sessions of special and general interest to the public and industrial safety men are included on the program of the twelfth annual congress of the National Safety council to be held at Buffalo, Oct. 1-5. All meetings will be held at the Statler hotel. The American association of Industrial Physicians and Surgeons and the New York state department of labor are also planning annual meetings in co-operation with the National Safety congress, and several joint sessions are scheduled.

Premier G. Howard Ferguson of Ontario will open the first general session. Dr. William J. Mayo, famous surgeon of Rochester, Minn., will also make an address. Royal B. Meeker, commissioner, Pennsylvania department of labor and industry, will talk on "International Aspects of the Safety Problem." Dr. Meeker was formerly chief of the research division, international labor office. Herbert A. Rowe, claims attorney, Delaware, Lackawanna & Western railroad, will discuss the national grade crossing campaign of the American Railway association. Dr. C. E. Ford, president of the Association of Industrial Physicians and Surgeons and John B. Madden, chairman of the industrial safety division of the Buffalo chamber of commerce, will preside at this session.

A complete educational exhibit demonstrating the work that has been done in the public schools during the past year has been arranged by the educational section of the National Safety council. A safety playlet, showing a scene in a foundry, will be staged by 11 steelworkers from the Edgar Thomson works of the Carnegie Steel Co. Three new sections of the National Safety council will be formed at this convention. The complete program will be announced later.

* * *

To Meet at Boston

The annual convention of the Motor and Accessory Manufacturers' association, composed of 430 makers of parts and equipment for motor vehicles in the United States, will be held at the Copley Plaza hotel, Boston, Sept. 19-21. Approximately 1000 people are expected to be in attendance.

* * *

English Society To Meet

The fall meeting of the Institute of Metals will be held at Manchester, England, Sept. 10-13. The proceedings will be opened on the evening of Sept. 10 by a lecture entitled, "The Use of Nonferrous Metals in Engineering," by Sir Henry Fowler.

Tuesday morning, Sept. 11, will be devoted to the reading and discussion of papers, after which the members will be entertained at luncheon by the reception committee at the Midland hotel. In the afternoon visits will be paid to several large plants and in the evening members will be received by the vice chancellor and authorities of the University of Manchester when the official opening and inspection of the new metallurgical laboratories will take place.

On the morning of Wednesday, Sept. 12, further papers will be presented and discussed, the afternoon being taken up with a trip along the Manchester ship canal. A smoking concert will be held in the evening. An excursion to Chester has been arranged for Thursday Sept. 13.

Convention Calendar

Aug. 20-30—American Institute of Mining and Metallurgical Engineers. Meeting at Quebec, Canada. F. F. Sharpless, 29 West Thirty-ninth street, New York, is secretary.

Sept. 10-14—American Chemical society. Fall meeting, Milwaukee. L. Parsons, P. O. box 1515, Washington, is secretary.

Sept. 17—American Ceramic society. Fall meeting, Grand Central Palace, New York. R. C. Purdy, Ohio State university, Columbus, O., is secretary.

Sept. 17-22—Chemical Industries. National exposition, Grand Central Palace, New York.

Sept. 24-28—American Association of Iron and Steel Electrical Engineers. Convention and exhibition, Auditorium, Buffalo. Headquarters of the association are located at 1007 Empire building, Pittsburgh.

Sept. 27-29—American Electrochemical society. Annual meeting at Dayton, O. Dr. Colin G. Fink, Columbia university, New York, is secretary.

Oct. 8-12—American Society for Steel Treating. Annual convention at Pittsburgh. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

Coast Inquiries Increase

Oil Companies Anticipating Substantial Increases in Steel Storage Facilities—Demand for Cast Iron Pipe Increasing—Prices Falling

SAN FRANCISCO, Aug. 4.—The outstanding feature of the local market for iron and steel products during the past week is the increase in the number of inquiries being received from oil companies for additional steel storage facilities. During the month just passed only a few awards were made for tanks, possibly five or six at the most, but pending awards and contemplated new projects promises a heavy tonnage of plates and shapes in the aggregate for the current month.

Prices on some lines have softened, noticeable on plates and shapes and in the bolt, nut and rivet market. On the other hand extreme firmness is noted in such products as pipe, sheets and wire.

While some companies report an increase in bookings for the month of July as compared with those for June, new buying, on the whole, fell below that of June. This condition was due, primarily, to the usual midsummer slackness during the vacation period and also to the fact that most consumers bought and specified rather heavily last month in order to take advantage of the old water freight rate which advanced the first of this month.

Bars, Plates and Shapes

Local bar mill operators report that bookings during the past month equaled those for June and that the outlook for the balance of the year is good. Movement of merchant bar material, however, is not as heavy as is that of concrete bars. Concrete bar business continues to be made up of relatively small awards, though during the week over 1200 tons in larger awards were placed. Pending business involving lots of over 100 tons aggregates more than 2000 tons. Six open hearths are in operation in this district this week. Prices remain unchanged at 3.25c and 3.65c for merchant and reinforcing bars respectively and deliveries are prompt.

While demand for cold-drawn material is not heavy here mill representatives report a satisfactory volume coming to hand, and stocks in the hands of distributors are moving out at a steady rate. As yet new extras on cold-drawn to correspond with the new extras on hot-rolled bars, have not been put into effect in this territory, but it is expected that the new price will shortly be announced. The market is firm here at 3.25c base Pittsburgh.

New buying in the hoop and band market during the past few weeks has been limited and inquiries have not been as numerous as was the case two months ago. Early deliveries are easier to obtain now. Prices generally remain unchanged at 3.15c to 3.30c base Pittsburgh for the larger sizes, although in one or two instances it is known that 3.15c price has been shaded. In the smaller sizes prices range from 3.50c to 3.75c.

A fair volume of bolt, nut and rivet business is coming to the hands of mill representatives in this district and the outlook is most favorable. Lower prices are in evidence and the market on large machine bolts, cut thread, is now 60 and 5 off as against 50-10-10 off in effect last week. On small rivets 60 and 10 off is now general and in several instances 65 and 10 has been named. A good volume of boiler and structural rivet business is being closed but prices have softened in this line as well. Contracts are being made for third quarter on the basis of 3.15c and 3.25c base Pittsburgh for structural and boiler rivets respectively and some spot business has gone at 3.10c and 3.20c respectively.

The Southern Pacific company has not yet closed on their inquiry for 400 kegs of track bolts. The Pacific Lumber company is asking for bids on 475 tons of rail.

Large Plate Tonnages Pending

Although there are several projects pending which involve some good sized tonnages only one award is noted this week. The Southern Pacific company closed on 250 tons of plates. No action has yet been taken on the 13 80,000-barrel tanks for the Associated Oil Co. nor on the 20 80,000-barrel tanks for the Shell Oil Co. involving a total of approximately 10,000 tons. The Pan-American is inquiring for two 55,000-barrel tanks for erection at Torrance, Cal. involving 300 tons and the Canfield Midway is asking for bids on one 80,000-barrel tank to be erected at Torrance. Several independent companies are colletcively asking for figures on 10 80,000-barel and 15 55,000-barrel tanks, involving 5300 tons. Prices have softened recently and 3.05c to 3.15c c.i.f. San Francisco now represents the general run of the market although 2.95c has been obtained on at least one lot. In the latter instance the buyer was able to secure the old 30 cent water freight rate from the East.

Activity in the structural shape market in this district during the last week was confined largely to small lots with the exception of the California hotel in San Francisco which involved 500 tons. These smaller lots have been fairly numerous with the result that most fabricators report sufficient bookings to keep them going for at least three months. As with plates, shapes have softened here and 3.05c to 3.15c c.i.f. San Francisco is considered the general run. Prompt deliveries are easier to obtain. Approximately 7000 tons are up for figures. Projects planned and on the architects' boards promise some good sized lots for release before long.

Warehouse Material

Out-of-stock distributors report sales for July fell off somewhat from those of the previous month but that they were much better than was anticipated at the beginning of the month. One large interest reports July sales slightly in excess of those for June. Nails, wire products and pipe are most in demand. Stocks in some items are extremely low and broken. No price changes have been made recently. The new bar extras have been put into effect here.

Buying of wire and wire products has not been as heavy recently as was the case two months ago, but despite the usual summer lull mill representatives state that demand has been heavier than was expected. Some buying for fall stocks is noted. Deliveries are not as prolonged now and as a result stocks are in better shape. Sixty to 90 days mill shipment can be obtained on bright nails and in some lines two to three weeks shipment is offered. Cement coated nails, however, can not be obtained under three months. No cancellations have occurred in this district. Prices remain unchanged and firm.

Pipe Market

Demand for the smaller sizes of cast iron pipe from private sources is increasing, though little buying of the larger sizes is reported. Municipal inquiry has fallen off during the past week but Los Angeles and Glendale this week placed some heavy tonnages.

No noticeable let up in demand for oil country and tubular goods is noted and stocks in the latter grade are still badly depleted and assorted. Distributors of oil country goods in the southern part of the state have requested no cancellations but on the other hand are still pressing mills for deliveries, a fact which would indicate that the curtailing of production in the oil fields has not been as severe as was reported. Oilfield operations reported to the state oil and gas supervisor for the week ending July 28, show 30 new wells started as compared with 22 during the previous week. Total new wells to date this year is 864, as compared with 791 the same date last year. Deepening or redrilling jobs numbered eight as compared with seven during the preceding week. Total to date this year 386; total same date last year 503.

1922 Lead Output Larger

Washington, Aug. 7.—Refined lead produced in the United States in 1922 totaled 532,662 short tons, while the output from domestic ores amounted to 468,746 short tons, according to the geological survey. In 1921 total production was 448,589 short tons while from domestic ore the refined lead output was 398,222 short tons. Missouri again led the states in smelting or refining primary lead, as well as leading in mine production. Apparent consumption of refined primary lead in the United States amounted to 492,705 tons in 1922 as compared to 444,872 tons in 1921. The world's smelter production of lead in 1922 totaled 1,040,000 tons of which the United States contributed more than one-third. The world output was the largest since 1918.

The Wopeco Machine Co., Inc., New Haven, Conn., has filed a preliminary certificate of dissolution with the secretary of state.

Improvement Seen

In Demand For Light Oil Distillates—No Change In Prices

New York, Aug. 7.—Demand for light oil distillates continues to improve, with one leading seller now sold several weeks ahead. This improvement, in conjunction with the somewhat decreased output, has strengthened prices but as yet no change is noted. Pure benzol continues to hold at 27 cents works in tanks and 32 cents in drums; 90 per cent benzol, 25 cents in tanks and 30 cents in drums; toluol, 30 cents in tanks and 35 cents in drums; solvent naphtha, 27 cents in tanks and 32 cents in drums and commercial xylol, 39 cents in tanks and 34 cents in drums.

Trading in naphthalene remains sluggish, with little or no demand and prices nominal at 8 cents works for flakes and 9 cents for balls. In less than carload lots prices are about one-half cent higher.

Little demand for sulphate of ammonia is noted, either from export or domestic sources. Prices continue at $3.05 to $3.10 works, on domestic business, and $3.30 to $3.35 port, in double bags on foreign. A steadying factor is the substantial business booked a couple of months ago and now being filled. Another, is the reduced output at several of the ovens, especially those supplying needs of some of the smaller steel plants.

Coke Oven By-Products

Spot*

Per Gallon at Producers' Plants in Tank Lots	
Pure benzol	$0.27
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29
Per Pound at Producers' Plants	
Phenol	$0.28
Naphthalene flake	0.08
Naphthalene balls	0.09
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$3.05 to $3.10
Contract	
Pure benzol	$0.27
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29
Per Pound at Producers' Plants	
Phenol	$0.28
Naphthalene flake	0.08
Naphthalene balls	0.09

*Spot distillates are subject to shading.

Work Without Accident

All the works in Massachusetts of the Wickwire-Spencer Steel Corp., the South and Central Works of the American Steel & Wire Co., the Graton & Knight Mfg. Co., Walden-Worcester, Inc., the Curtis & Marble Machine Co., and the Worcester Stamped Metal Co., of Worcester, operated through June without a lost time accident, under the rules governing the competition of the Worcester County Safety council.

Export-Import Trade with South America Gains

Washington, Aug. 7.—American export and import trade with South America in the year ended June 30 aggregated $739,427,154, an increase of 55 per cent over the $479,710,139 of the preceding year, states Dr. Julius Klein, chief of the bureau of foreign and domestic commerce. In spite of the advantage of depreciated currency, European competition is not ousting American goods from these markets, Dr. Klein asserts.

F. R. Eldredge, chief of the far eastern division of the bureau, gives American imports from the Far East in the fiscal year ended June 30 as $1,068,925,320 and exports $558,665,206. Twenty-one per cent of this country's foreign trade last year was with the Orient, Mr. Eldredge points out, a gain of 25 per cent over the previous 12 months.

Welsh Plate Exports Large

Washington, Aug. 7.—Except in the opening months of 1913, the export movement of tin and black plates through the principal ports of Wales has never been so great as in the first four months of 1923, states American Consul Cooke at Swansea in a report to the department of commerce. In this four-month period the Welsh mills exported 116,821 gross tons of tin plate, 42,397 tons of black plates and 8582 tons of galvanized sheets.

1922 Zinc Output Larger

Washington, Aug. 7.—Production of primary zinc in the United States in 1922 totaled 354,277 net tons, of which all but 1003 tons came from domestic ore, the revised figures of the United States geological survey show. The 1921 total of primary zinc was 200,500 tons. Production of secondary zinc amounted to 69,314 net tons in 1922, compared with 33,833 tons in 1921. Distilled and electrolytic zinc produced in the United States in 1922 aggregated 387,265 net tons, valued at $44,148,000. Of the 354,277 net tons of primary zinc produced in 1922, Illinois accounted for 76,266 tons, Oklahoma for 74,537, Pennsylvania for 57,319 and Kansas for 24,167.

The Bridgeport Rolling Mills, Inc., Bridgeport, Conn., has increased its capital stock from $300,000 to $1,600,000.

New Buying

Light In Refractory Market—Makers Have 30 To 60 Days Business

Pittsburgh, Aug. 7.—New buying of refractories continues light although order-book backlogs still are sufficiently sizable to permit average operations of 80 per cent among the brick kilns. Some are on an even higher basis and while a few makers are adding to their shed stocks, one or two prominent ones are running full capacity and report inability to fill all of their orders in the required time. Brick makers generally, have 30 to 60 days' business ahead and one or two have 90-day bookings. New construction is for the most part lacking in present negotiations, the majority of orders still calling for requirements only comprising 50,000 to 250,000 brick at a time. Customers are specifying on contracts with a fair degree of regularity and two or three blast furnace slips lately have increased the number of orders for repairs. The recent blowing out of blast furnaces has not been reflected in any great influx of orders for brick.

Ordinarily during August, relatively few brick are bought; during the vacation period repairs are not made unless they are absolutely necessary. The trade however, is encountering a more optimistic tone among consumers than was the case two or three weeks ago and the general expectation is that early in September a good buying movement will start. Prices are unchanged and while in some isolated cases the selling prices are below current market quotations, the latter are being fairly well maintained. Several carload orders for magnesite brick recently were booked as were a few orders for as much as 25,000 to 50,000 chrome brick at a time. Magnesite and chrome are firm at $65 and $50, respectively.

Refractories

FIRE CLAY BRICK	
(Per 1000 f.o.b. works)	
Pennsylvania, No. 1	$48.00 to 51.00
Pennsylvania, No. 2	43.00 to 46.00
Ohio, No. 1	45.00 to 47.00
Ohio, No. 2	40.00 to 43.00
Illinois, No. 1	48.00 to 50.00
Illinois, No. 2	45.00 to 47.00
Kentucky, No. 1	45.00 to 47.00
Kentucky, No. 2	40.00 to 42.00
Missouri, No. 1	43.00 to 45.00
Missouri high grade	48.00 to 53.00
Maryland, No. 1	50.00 to 53.00
Maryland, No. 2	44.00 to 47.00
SILICA BRICK	
Pennsylvania	45.00
Chicago	52.00 to 54.00
Birmingham	48.00
MAGNESITE BRICK	
(Per Net Ton Seaboard Base)	
9 x 4½ x 2½	$65.00
CHROME BRICK	
(Per Net Ton)	
9 x 4½ x 2½	$50.00

Sheet & Tube Income Gains in Second Quarter

The Youngstown Sheet & Tube Co. from its second quarter operations shows a surplus available for dividends of $3,886,624, an increase of $674,000 over the first quarter. The statement includes earnings of the Brier Hill Steel Co. plants now opened, but not those of Steel & Tube Co. of America, which was taken over about July 10.

After payment of dividends, $2,402,897 was carried to surplus, making the total surplus for the first half of the year $4,451,463. Earnings for the first half of the year were at the rate of $13.50 per share of the outstanding 987,606 shares of no par value common stock. Besides the liberal depreciation shown in the statement, $2,268,440 has been deducted from total receipts for the maintenance, repair and upkeep of the plants in the second quarter.

A comparative table of first and second quarter statements is as follows:

	*First quarter	Second quarter
Net earnings	$4,383,418	$5,779,718
Gross income	4,714,259	6,197,949
Depreciation and depletion	995,352	1,265,223
Interest on debt	54,183	146,116
Federal taxes (est.)	454,000	479,000
Net income	3,210,724	3,886,624
Preferred dividends	174,552	249,219
Common dividends	987,606	1,234,507
Surplus balance	2,048,566	2,402,897
Earnings per share	$3.07	$3.70

*The first quarter includes Brier Hill earnings for March only.

Larger Japanese Stocks

Washington, Aug. 7.—An estimate of the stock of steel materials in Japan at the end of May, 1923, with comparative figures for the end of April in parentheses, made by the Mitsui Bussan Kaisha, a large commercial firm is quoted in a report to the department of commerce as follows. Bars, 36,534 long tons (25,797); plates and sheets, 34,913 (31,545); shapes 14,262 (13,065); galvanized sheets, 12,326 (13,577); tin plate, 4493 (4488); nails 622 (4018); wire, 9920 (8455); rails, 8458 (3526); and other products, 4762 tons (2492 tons).

Approve Financing

Youngstown, O., Aug. 7.—Stockholders of the Youngstown Steel Co. at a special meeting July 27, approved financing and reorganization plans of the directors which include the increase in common stock to 7500 shares of no par value and authority to create a $1,500,000 7 per cent preferred issue of which about $1,250,000 will be actually sold. That part of the company's assets which include the new mechanical puddling plant nearing completion near Warren, O., was transferred to the American Puddle Iron Co. The majority of the common stock of the puddling company will be held by the Youngstown Steel Co. The puddling company is capitalized at $3,500,000. Operation of the mechanical puddlers is expected to start about the middle of September.

Skoda Plant Sells Bonds

London, July 30.—An issue of £1,000,000 ($4,650,000) 8 per cent first mortgage sterling bonds has been underwritten in London for the Skoda works in Pilsen, Czecho-Slovakia. The Skoda plant was formerly the largest Austrian gun works. Schneider & Co., Creusot, France, now has a large interest in the Skoda company. According to a recent valuation, the fixed assets of the company now exceed $19,500,000 of which $16,000,000 is represented by the plant at Pilsen. The company is now manufacturing steel castings, locomotives, railroad cars, and various railroad specialties. Since the occupation of the Ruhr, heavy orders have been received for export to Germany and other parts of central Europe.

Cuban Ore Output Gains

Washington, Aug. 7.—The total production of the mining industry of the Santiago de Cuba consular district in 1922 was 468,340 tons of iron ore, hematite and magnetite and about 20,000 long tons of manganese ore containing about 30 per cent manganese, from which 4100 tons of concentrated product were obtained. This shows a slight increase over 1921, due to greater activity in the steel industry in the United States.

Steel Foundries Net Up

Net earnings of the American Steel Foundries Co., for the six months ended June 30, 1923, totaled $4,197,004 after deduction of federal taxes. This is slightly more than twice the $2,098,139 earnings for the same period last year, before federal tax deductions. Surplus earnings in the half just ended were $3,459,324, after reserves for depreciation and fixed charges had been provided for and after other income had been credited. In the first half of 1922, after the same provisions, the surplus amounted to $1,452,859.

Gulf States Earnings Up

The Gulf States Steel Co., Birmingham, Ala., reports net operating income for the three months ended June 30, 1923, amounted to $597,670. Net income, after taxes, depreciation and other charges, was $439,928, net income for the first quarter of 1923 was $533,978.

Czech Works Operating at 45 Per Cent

Washington, Aug. 7.—Current reports from Czecho-Slovakia received by the department of commerce, indicate no important change in the activity of the local iron and steel mills, which are continuing to operate around 45 per cent of capacity as for two or three months past, with production on a basis of approximately 850,000 metric tons of steel annually. Of this quantity about 25 per cent is used in the domestic market and the remainder is exported, to Germany in particular. Orders for export are declining and prices, while still unchanged, are showing a soft tendency. It is estimated that orders now on hand will keep the mills occupied until next August, at approximately the same per cent of capacity.

The Mining, Iron and Machine association reports that the iron and steel production in Austria for the first quarter of 1923 was as folloys: Open-hearth pig iron, 71,212 metric tons; foundry pig iron, 21,479 tons, bessemer steel, 11 tons; martin steel, 84,520 tons; puddled iron, 87 tons; puddled steel, 187 tons; refined steel 7753 tons; finished products—iron bars, 20,811 tons, steel bars, 9333 tons, girders 2958 tons, rails 4003 tons, sheet iron, 1021 tons, sheet steel, 694 tons and rolled wire, 17,409 tons.

Dump Much Coal at Ports

Washington, Aug. 7.—The American Railway association reports that 10,217,830 tons of bituminous coal were dumped at Lake Erie ports for transshipment up the Great Lakes between Jan. 1 and July 2. Only once, in 1919, has this tonnage been exceeded for a like period, and then by only 38,059 tons. In the same period of 1922 3,822,012 tons of bituminous coal was left at Lake Erie ports.

Appoint Receivers

The Federal court at Chattanooga, Tenn., recently named Capt. J. F. Lucey and D. L. Grayson as receivers for the Lucey Mfg. Co. of that city, one of the largest manufacturers of well drilling machinery in the Southeast. The appointment was made on application of the creditors. Captain Lucey was the founder of the firm, and the receivership was necessitated by financial difficulties on the part of Lucey branches in other cities. The Chattanooga plant is said to be in excellent financial shape. Recently the firm announced receipt of a $1,000,000 order for oil well machinery from the Barnsdall Corp. in Russia.

Current Iron and Steel Prices of Europe

Last Reported Prices Converted into Dollars at Rates of Exchange, August 6

British Market

Home Market Prices. Gross Tons at Works or Furnace

Corrected to Date by Cable

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	32.56	7 2 6
Sheet bars	32.56	7 2 6
Wire rods	49.70	10 17 6
FINISHED STEEL		
Steel bars, England, ⅝ to 3-inch	42.27	9 5 0
Steel bars, England, ⅝ to 3-inch, for export	39.99	8 15 0
Plates, ship, bridge and tank, England	42.27	9 5 0
Plates, ship, bridge and tank, England, for export	41.13	9 0 0
Plates, ship, bridge and tank, Scotland	41.13	9 0 0
Beams, England	41.13	9 0 0
Beams, England, for export	38.85	8 10 0
Beams, Scotland	41.13	9 0 0
Beams, Scotland, for export	39.99	8 15 0
Sheets, b'ack, 24 gage	57.12	12 10 0
Sheets, black, 24 gage, for export	54.84	12 0 0
Sheets, galvanized, 24 gage	85.69	18 10 0
Rails, 60 pounds and over	43.42	9 10 0
Rails, 60 pounds and over for export	41.13	9 0 0
Tin plate, base box, 108 pounds	5.26	1 3 0
Steel hoops	52.56	11 10 0
Steel hoops, for export	50.27	11 0 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	22.85	5 0 0
Hematite, West Coast, Mixed Numbers	22.85	5 0 0
Basic, Middlesbrough	22.85	5 0 0
No. 3 Foundry, Middlesbrough	22.85	5 0 0
No. 3 Foundry, Derby, Leicester, Nottingham	21.71	4 15 0
No. 3 Foundry, Northamptonshire	21.71	4 15 0
No. 3 Foundry, Staffordshire	22.39	4 18 0
No. 3 Foundry, Scotch	23.99	5 5 0
Ferromanganese, 76 to 80 per cent	82.26	18 0 0
Ferromanganese, 76 to 80 per cent, for export	84.55	18 10 0
COKE		
Yorkshire furnace	5.94	1 6 0
Yorkshire furnace, for export	10.28	2 5 0
Yorkshire foundry	7.31	1 12 0
Yorkshire foundry, for export	10.28	2 5 0

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	——*	6,925,000†
Foundry, No. 3, Oberhausen	——	6,925,000†
Bessemer Stahleisen, Siegen	——	6,925,000†
Foundry, No. 1, Oberhausen	——	6,925,000†
Luxemburg Foundry	——	6,925,000†
COKE		
Ruhr furnace	——	3,044,000
Ruhr foundry	——	3,044,000
SEMIFINISHED STEEL		
Billets	——	12,960,000
Sheet bars		nominal
Wire rods		nominal
FINISHED STEEL		
Standard rails		nominal
Merchant bars		nominal
Structural shapes	——	18,750,000
Ship plates	——	21,131,000
Medium plates, 3 to 5 millimeters	——	21,131,000
Sheets, below 3 millimeters	——	31,257,000
Tin plate		nominal
Plain wire		nominal
Bands and strips		nominal

All prices are f.o.b. furnace or mill.

*Dollar equivalents are misleading owing to the terrific depreciation of the mark at present.

†With German coke; where foreign coke is used quotations are higher.

On account of the occupation of the Ruhr these prices are largely nominal and cover domestic business only. Export prices are usually quoted, where deliveries can be made, in foreign currency according to the country of destination.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	24.85	430
Basic bessemer, Lorraine	22.54	390
Foundry, Longwy, No. 3, sand-cast	21.96	380
Foundry, Longwy, No. 3, chill-cast	22.54	390
Ferromanganese, 76 to 80 per cent	89.59	1,550
COKE		
French furnace	7.80	135
German, furnace, f.o.b. frontier*	10.40	180
German furnace, f.o.b. frontier**	14.45	250
French foundry	8.38	145
SEMIFINISHED STEEL		
Blooms	29.48	510
Billets	32.95	570
Sheet bars	40.46	700
FINISHED STEEL		
Standard rails	34.68	600
Merchant bars	34.10	590
Angles	33.24	575
Normal beams and profiles	33.24	575
Plates, ship and tank, 10 millimeters and thicker	37.86	655
Plates, bridge and tank, 5 to 10 millimeters	38.44	665
Sheets, black, 3 millimeters	40.75	705
Sheets, blue annealed, 2 millimeters	47.97	830
Shafting, cold-drawn, 40 to 60 millimeters	75.14	1,300
Bars, 2 per cent nickel steel	104.04	1,800

All prices are f.o.b. furnace or works.

*Up to 50 per cent of normal requirements.

**Over 50 per cent of normal requirements.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	20.81	440
Basic open-hearth, Belgian	25.78	545
Gray forge, Belgian	12.77	270
Foundry, No. 3, Belgian	21.76	460
Foundry, No. 3, Luxemburg	21.99	465
Foundry, No. 3, Lorraine	21.99	465
SEMIFINISHED STEEL		
Blooms	27.91	590
Billets	29.56	625
Sheet bars	30.75	650
Wire rods	42.57	900
FINISHED STEEL		
Standard rails	33.11	700
Merchant bars	34.29	725
Normal beams and profiles	33.11	700
Plates, 5 millimeters and thicker	35.48	750
Sheets, black, 3 millimeters	40.21	850
Sheets, galvanized, 1 millimeter	87.51	1,850
Plain wire	56.76	1,200
Galvanized wire	70.95	1,500
Wire nails	59.13	1,250

All prices are f.o.b. furnace or works.

Buying Fails To Increase

(*Continued from Page* 367)

higher quotations to British customers. Belgian billets are now quoted at £7 17s 6d ($36.14) whereas English material can be bought at £7 15s ($35.57). A few contracts were made at the quarterly meeting, but buying is for the most part in suspense. A mild sensation has been caused by a sharp cut in the prices of Welsh wire rods which this week have been quoted in Birmingham £11 10s ($52.78), delivered, equal to about £10 17s 6d ($50.90), mills. This is a commodity for which prices have been rather firmly held. Steel, Peach & Tozer who specialize on wire rods still are quoting £13 ($59.67) delivered, presumably on account of the state of their order book. The large users of wire in Birmingham are hoping that this reduction will bring about lower wire prices, recent quotations having handicapped them severely in international competition.

In the finished steel trade there is almost a scramble for business. Circulars have been received by Birmingham consumers announcing a reduction of 5 shillings ($1.14) in sections, joists, angles, etc. This follows a similar reduction about a fortnight ago and makes the new basis £9 15s ($44.44). Plates are 10 shillings ($2.29) cheaper. The steelworks are in a fairly competitive position owning to the extensions and improvement of plant during the war.

In the Barrow area a little improvement is reported. The mills of the Barrow Hematite Co. have about a month's work in hand, and it has been found possible to restart the rail mills at Workington. Axles and tires continue a good line, the Sheffield houses specializing on this work having fair orders on hand. The state of the steel trade at Sheffield is indicated by the addition of 400 to the number of unemployed steelworkers in that city. A lot of steel furnaces are idle, but among the more favored are the Templebrough works where eight siemens furnaces have been started.

One of the indirect evils resulting from the Ruhr occupation is the sagging of railway orders. Nearly all the railway business on hand is from foreign companies, the English railways keeping back their contracts, well knowing that present prices are artificial. The recent amalgamation of railways has enabled them to economize by transferring rolling stock from one line to another, an arrangement which assists in the postponement of orders.

Scrap steel still is a slow market. Some sales have been made at £3 17s 6d ($17.78), delivered in South Wales, though the general quotation is £4 ($18.36). Steel turnings quoted at £2

17s 6d ($13.19) are practically unsalable. The fall in billets has once more given an opening to rerollers who are selling small steel bars at £10 ($45.90) and steelmaking skelp at £10 10s ($48.19).

The Staffordshire iron and steel trade could hardly be worse, not more than one-fourth of the plant being employed. Following the Belgian improvement No. 3 bars are quoted at a minimum of £9 ($41.31), delivered. One Belgian firm is demanding £9 12s 6d ($43.86). Further weakness has developed in galvanized sheets, £17 15s ($81.47) being a comomn quotation, with concessions for a good order. This business has been active all the year, but orders are being rapidly worked off and are not being replaced. The activity of the motor building trade keeps up a fair demand for black sheets.

The collapsed state of continental exchanges is usually assigned as the reason for the poor buying of tin plates, and some slight recovery in tin values has narowed profits. Contrary to expectation the stabilization committee is keeping up the price of semifinished steel at £9 2s 6d ($41.88) subject to the usual rebate of 2 shillings 6 pence ($0.57), but this is an inflated price, and there is a general clamor for revision. The price of tin plates is retained at £1 3s 1½d ($5.30) f.o.b. Bristol channels ports.

French Steel Prices Are Advancing

European Staff Special

Office of IRON TRADE REVIEW,
23 Rue de la Bienfaisance

Franc—$0.06

PARIS, July 27.—The iron and steel trade is quiet, as usual at this time of the year, and little change is anticipated in the market for the next two months. The mills have sufficient tonnage on their books to insure normal operations for several weeks. Prices are steady.

The falling off in receipts of coke from the Ruhr stocks is causing some anxiety in metallurgical circles. Deliveries of coke from the Ruhr now average 3400 tons daily, whereas a few weeks ago they were running as high as 6000 tons. The price of coke has been fixed officially for August at 185 francs ($11.10) for that classified as P1, from the Ruhr, which is an increase of 5 francs ($0.30) over the present price. Another increase in the price of P1 coke is anticipated in September. The P2 price will remain at 250 francs ($15.00) for August. This price is for all coke delivered to the blast furnaces other than that coming from the Ruhr or French ovens. If the franc remains at present low levels for any length of time the P2 price will go higher as nearly all the coke received under this classification is imported from England and the United States. As time goes on the proportion of P1 coke delivered to consumers is gradually decreasing due to passive resistance in the Ruhr. It is evident that unless some decision is reached soon as to reparations, practically all coke will be billed at the P2 price, and iron and steel prices will have to be advanced considerably to compensate for increased production costs.

Pig iron production continues to increase slowly. The Forge & Acieries du Nord et de l'Est have blown in another furnace at Poirier near Valenciennes. Prices are firm. Producers are avoiding heavy commitments owing to the uncertainty of coke costs. Export business is satisfactory owing to the low franc value, but for this very reason the market cannot be considered as normal. Chill-cast No. 3 foundry iron is quoted at 380 francs ($22.80) per metric ton f.o.b. furnace. Hematite iron is being sold around 440 francs ($26.40) f.o.b. furnace, Center district.

An increase of 20 per cent in the price of semifinished steel products has been announced by several makers. The mills are not willing to protect buyers for over one month ahead even at the new prices. A few manufacturers who have been seeking tonnages have been able to place them at old prices but the market is expected to stabilize at the new levels within several days. Basic bessemer blooms are quoted at 450 francs ($27) to 500 francs ($30) and billets average around 530 francs ($31.80).

Four weeks' delivery is now being offered on merchant bars. Price shading has ceased and Lorraine makers are now quoting 600 francs ($36.) f.o.b. mill. Jobbers appear to have satisfied their wants as little business is being received from this source. The French state railway is asking for bids on 2000 tons of 55-kilo rails. This order is the subject of keen competition as rail makers are at the present time in need of tonnage.

German Prices Fixed Every Other Day

European Special Service

Mark—$0.0000015

DÜSSELDORF, Germany July 26.—The official prices of the blast furnace and steel syndicates are now fixed every other day on account of the continuous depreciation of the mark. These quotations, however, have only a nominal value owing to the extremely confused conditions prevailing at present. Trading proceeds on a hand-to-mouth basis and considering the conditions there is a considerable volume of business. Pig iron, according to the latest quotation, is 4,765,000 marks per ton, but this, owing to the depreciation of the past few days, is equivalent only to $7.15. Furnace coke at 2,129,000 marks is equivalent to $3.20. Billets have recently been sold for 8,193,000 marks ($12.30) and sheet bars for 9,064,000 marks ($13.60) a ton. Shapes, bars and plates now range from 10,345,000 to 11,663,000 marks, equivalent to 0.71c to 0.78c per pound. Only a week ago these values were equivalent to 1.32c to 1.50c per pound, and although the price in marks has been drastically advanced since that time, the gold value of the current quotations is much less. This illustrates the impossibility of making any accurate comparisons between market conditions in Germany and those in other countries at the present time.

An increasing number of Ruhr furnaces and steel plants are shutting down. This is due partly to the fact that the French are now seizing stocks of fuel at blast furnaces and steel plants. Stock have been seized recently at the Krupp works at Essen and at the plants of the Bochumer Verein, Westphaelische Stahlwerke, Hoesch, and the Union Works at Dortmund.

A skilled man is now earning 25,000 marks per hour, but wages are being increased daily.

More Furnaces Starting Up in Japan

Foreign Special Service

Yen—$0.495

TOKIO, Japan, July 26.—While Indian and Chinese pig iron continues to arrive, more Japanese stacks are going in blast, and there is some apprehension of an oversupply. A furnace at Wanishi, Hokkaido, which has been idle for more than a year, is being relighted by the Japan Steel Works. This is the second furnace relighted since last month. A new furnace plant at Tsurumi, near Yokohama, which the president of the Toyo Kisen Kwaisha has been building as an

(*Concluded on Page* 405)

Decide on Short Workday Plans

Directors of Steel Institute Announce Industry Will Begin at Once To Eliminate 12-Hour Shifts—Employes Transferred to 8-Hour Turn Will Receive 25 Per Cent Increase in Hourly Rate

NEW YORK, Aug. 7.—That the steel industry will at once begin the total elimination of the 12-hour day and will progress as rapidly as the supply of labor will permit, and that hourly and base wages will be increased about 25 per cent, was announced by E. H. Gary, chairman of the American Iron and Steel institute, following a special meeting of the institute directors at the Metropolitan club New York, Aug. 2. Judge Gary issued the following statement:

"Following the correspondence between President Harding and the steel institute, and as a result of the most painstaking investigation, manufacturers of iron and steel, representing substantially the entire industry of this country, will now begin the total elimination of the 12-hour day and will progress as rapidly as the supply of labor will permit. It is impossible to say when the changes will be completed. It will depend upon labor conditions at respective plants. There will be no unnecessary delay on the part of anyone.

"Where the hours of employes connected with continuous process are reduced from 12 to eight hours, their wage rates will be so adjusted as to afford earnings equivalent to a 25 per cent increase in hourly and base rates.

"All other workmen will be on 10 hours or less and their present hourly and base rates will be continued; but whenever it is practicable, by promotions or changes in position, the daily earnings will be accordingly adjusted."

It was announced that aside from this written statement, Judge Gary had no comment to make. Earlier in the day president of the United States Steel Corp.'s subsidiaries held a meeting in Judge Gary's office but no statement was issued as to developments at this meeting.

Strike at Sydney Steel Plant Called Off

Toronto, Ont., Aug. 6.—The strike of the steel workers in the employ of the British Empire Steel Corp. at Sydney, N. S., is ended. At a mass meeting a resolution to end the strike and return to work was covered by a majority of about 65 per cent. A large proportion of the men had previously gone back, as according to an official statement 2505 men were working, out of approximately 3500 who were there when the strike began. The men walked out June 27, making a demand for a 20 per cent increase in wages. Many disturbances occurred and the district was occupied by provincial police and about 1500 soldiers. The 8000 miners who went out in sympathy and demanded the withdrawal of the military returned to work July 21.

Real Wages Higher Than in 1920, Is Report

Contrary to general belief, the American wage earner in 1923 is better off than during the so-called "peak period" of three years ago. He is, in fact, in a more prosperous condition than for a long time. His earnings have risen in the past year so much more than his living expenses that 1920 no longer need be considered as the most recent high-water mark for the worker in industry. These conclusions have just been announced as the result of researches into wages and the cost of living by the National Industrial Conference board, New York. As the result of a study of conditions in plants employing more than 600,000 workers, the board finds that the "weighted" or comparative excess of rising wages over rising living costs was between 17 and 18 per cent. greater in May, 1923, than in June, 1920, with the figures of the last prewar month, July 1914, as a basis. The board states:

"In order to measure the effect of fluctuations of the cost of living upon earnings, a figure known as 'real' earnings is developed by dividing the index number of hourly or weekly earnings by the index number of the cost of living.

"It is true that wages were at their highest levels in 1920, but the cost of living was also at that time high. With the July, 1914, figures taken as 100, the index number of hourly earnings in June, 1920, was 248, and of weekly earnings 240, while the cost of living index number was 203. The index number of 'real' hourly earnings was consequently 122 and that of 'real' weekly earnings 118. From that point the cost of living declined more rapidly than earnings with the result that there was an advance in 'real' weekly earnings until in March, 1921; 'real' hourly earnings stood at 133 and 'real' weekly earnings were at 120 in September and October, 1920, their high points before the present.

"Beginning with the middle of 1922, earnings again began to rise, first as a result of longer hours worked and later because of increases in wage rates. As a result the index number of hourly earnings in May, 1923, was 223 and of weekly earnings 218. For the same month the cost of living index number was 160.3. Thus wages were fast approaching the peak levels while the cost of living was considerably below the peak and in consequence 'real' earnings rose well above the former peak figures. In May, 1923, the index number of 'real' hourly earnings was 139 and that of 'real' weekly earnings 136, indicating that in the purchasing value of his earnings the wage earner was better off in May, 1923, than during the peak months of 1920."

Metal Trades Wages and Earnings Averaged

The average of hourly rates paid in machine shops, foundries and pattern shops in New England in June, among plants represented in the National Metal Trades association, was 51.9 cents, and the average hourly earnings 53.9 cents. In the Ohio-Indiana district the hourly rate average was 53.9 cents, and hourly earnings, 57.3 cents. In Michigan the hourly rate was 51.4 cents and hourly earnings 55.7 cents, and in the Illinois, Wisconsin and Missouri district, hourly rate 53 cents, hourly earnings 57.5 cents. Averages are not given for the New York, New Jersey and Pennsylvania group in the report as issued by the National association, but some of the averages for plants in the local areas were as follows: New York and New Jersey—hourly rate 54.3 cents; hourly earnings (55.9 cents): Philadelphia 58.4 and (60.2): Erie 51.8 and (51.8): Buffalo 60 and (62): Syracuse 51 and (55.1). The hourly earnings in each case are given in parenthesis.

In issuing the foregoing figures, the National association makes this explanatory statement:

"The purpose of this tabulation is to indicate the trend of wages from month to month. It is based on average wages paid in machine shop, foundry, pattern shop, common labor. Under machine shop, foundry and pattern shop, only employes on an hourly basis were included. Supervision, common labor and employes paid on weekly or monthly basis were excluded. Under common labor employes performing common work only, as laborers, yard men and truckers, were included. "Hourly rate" is the wage paid per hour on straight time work. "Hourly earnings" are the total earnings divided by the number of hours worked. A few companies representing different industries in each of our districts were selected and the tabulation prepared from these returns."

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

ANDREW M. KENNEDY, superintendent of the open-hearth department of the Trumbull Steel Co., Youngstown, O., and formerly with the Sharon Steel Hoop Co., Sharon, Pa. has resigned and accepted the position of general manager of the Sharpsville Furnace Co., Sharpsville, Pa. In his new position he succeeds R. W. Coats, whose resignation was announced to take effect Sept. 1.

Robert Hobson, president of the Steel Co. of Canada, Hamilton, Ont., is in England on a business trip.

A. A. Ziegler of Morris Wheeler & Co., Philadelphia, has returned from a trip to the Pacific coast.

Richard Wastcoat, treasurer of the Paragon Gear Works, Taunton, Mass., has been elected president of the Taunton chamber of commerce.

R. W. Chandler, manager of the industrial truck division of the Yale & Towne Mfg. Co., Stamford, Conn., plans a vist to the manufacturing centers of Europe.

C. P. Holland, formerly purchasing agent for the Page-Lewis Co., Chicopee Falls, Mass., now holds a similar position with the Hemden Grinding Wheel Co., Springfield, Mass.

H. D. Jenkins has been appointed Chicago district representative for the Mahoning Valley Steel Co., Niles O., with headquarters at 10 South La Salle street.

D. V. Williamson, formerly connected with the American Manganese Bronze Co., Philadelphia, has been made sales engineer for the Detroit Electric Furnace Co., Detroit.

Clarence E. Anderson has been appointed assistant manager of the New York office of B. D. Whitney & Son, Inc., Winchendon, Mass., machinery builder.

H. G. Dalton of Pickands, Mather & Co., Cleveland, is spending several weeks in England. He expects to return to the United States the latter part of August or early September.

Major Earl McFarland, in charge of manufacture at the United States armory at Springfield, Mass., recently was named commandant. Vice Col. Thales L. Ames, has been transferred to Governor's Island, N. Y.

Harry W. Goddard, chairman of the board of directors of the Wickwire Spencer Steel Corp., Worcester, Mass. who has been passing the summer in Europe, is expected to sail for home on the OLYMPIC, Aug. 8.

Frank B. Zeller, for 15 years connected with the New York Air Brake Co., New York recently resigned his position as purchasing agent for the company, effective Aug. 15. His future plans have not been announced.

J. H. Crossley, of the Metropolitan-Vickers Electric Co., Manchester, England, now is in this country studying electric heating development for the purpose of promoting this application of electricity in England.

William Hodges has resigned as production manager of the Plainville, Conn. branch plant of the Standard Steel & Bearings, Inc., and will return to Illinois where he will engage in business.

W. E. Dunn Jr., secretary of the Southern Metal Trades association, will sail Aug. 18 to attend the international congress of foundrymen in Paris which opens Sept. 2. Mr. Dunn will represent the metal trades industry of the South.

Samuel L. Smith, vice president of the National Malleable Castings Co., Cleveland, sailed for the United States from Southampton on the MAJESTIC. July 26. While in Europe Mr. Smith visited London, Berlin, and other centers on business.

George S. Davis, formerly in the sales department of the Dover Fire Brick Co., has been appointed Cleveland, district sales manager for the Ashland Fire Brick Co., Ashland, Ky., with offices at 1252 East Fifty-fifth street, Cleveland.

Stanley H. Smith formerly representative for the Pennsylvania Steel Co., and the Bethlehem Steel Corp. in Cleveland and Chicago, and who now acts as manufacturers' agent in Cleveland, recently was appointed district representative for Ohio for the Titusville Forge Co., Titusville, Pa.

Richard F. Grant, a member of the M. A. Hanna Co., Cleveland, and president of the Cleveland chamber of commerce, has been elected a director in the sixth district of the United States chamber of commerce. The sixth district includes Ohio, Michigan, Indiana, Illinois and Wisconsin.

John M. Gray Jr. has been named president of the Gray & Dudley Co., Nashville, Tenn., which operates two large foundries. He has been vice president of the company since 1895, and in his new position succeeds R. M. Dudley who has been named chairman of the board of directors.

W. H. Stewart, who was sales agent at Montreal, Que., for the Bethlehem Steel Export Corp., New York, has been elected vice president of the company to succeed Frank Purnell, who recently resigned to become vice president of the Youngstown Sheet & Tube Co., Youngstown, O.

W. R. Barnett, superintendent of the Zanesville, O., plant of the American Rolling Mill Co., recently resigned. He has been associated with the Zanesville plant of the American company for the past 20 years the last 11 as assistant superintendent and superintendent. His future plans have not been announced.

Frank L. Estep, of Perin & Marshall, iron and steel works engineers, New York, is in London on his way to the United States from India where he recently completed the construction of a mill for the Tinplate Co. of India. Before returning to New York, Mr. Estep will spend several weeks in England.

A. E. Thiffault, formerly connected with the American Sheet & Tin Plate Co., Pittsburgh, and Raymond I. Caspers, formerly with the Illinois Steel Co., Chicago, and the American Sheet & Tin Plate Co. have been placed in charge of the Chicago office of the Surplus Steel Exchange, Inc., New York, recently opened at 2257 Oakdale avenue, to handle midwestern business.

Obituaries

WILLIS F. McCOOK, aged 72, president of the Pittsburgh Steel Co. and senior member of the law firm of McCook & Jarrett, Pittsburgh, died Aug. 5, in West Penn hospital where he underwent an operation Aug. 2, following which pneumonia set in. Mr. McCook was one of the founders, in July 1901, of the Pittsburgh Steel Co. He was a director of the company since its inception and president since Nov. 1, 1920. He also

WILLIS F. McCOOK

was identified with the following corporations: Pittsburgh Steel Products Co., vice president and director; Mesaba Cliffs Iron Mining Co., vice president and director; American Austrian Magnesite Corp., vice president and director; American Refractories Co. of Pennsylvania, vice president and director; Concordia Electric Co., vice president and director; and director of various financial and charitable institutions. He was a director of the American Iron and Steel institute. During his career as a lawyer, Mr. McCook was connected with the organization of many of western Pennsylvania's largest industrial enterprises in the capacity of counsel. Early in his career he was the legal representative of Henry C. Frick and T. M. Carnegie. He organized the Frick Coke Co. at the time the Carnegie Steel Co. entered into business relations with Mr. Frick and his associates. Mr. McCook was counsel for Mr. Frick in the latter's celebrated fight with Andrew Carnegie. Later he devoted much of his time to representing large oil corporations, including the Guffey interests. He also was counsel for the Equitable Life Insurance Society of New York. He was an active figure in the organization of the Republic Iron & Steel Co., the American Steel & Wire Co., and similar corporations. Mr. McCook was born at Lisbon, O., in 1851. His parents moved to Pittsburgh during his infancy and he had been a resident of Pittsburgh all his life. He graduated from Yale university in the class of 1873, received his legal education at Columbia university, and was admitted to the bar of Pennsylvania in 1875. He was a member of numerous clubs and societies.

Thomas B. Conroy, president of the Conroy Boiler & Tank Co., Chicago, died July 29, at his home in that city. He was 62 years old.

Walter L. Mingledroff one of the owners of the Forest City Machine Co., Savannah, Ga., died recently at at his home in that city. He was 60 years old.

Eugene P. Terry, formerly secretary and treasurer of the Babcock & Wilcox Co., New York, died at his home in Brooklyn, July 29, following an illness of nine years. He was 44 years old.

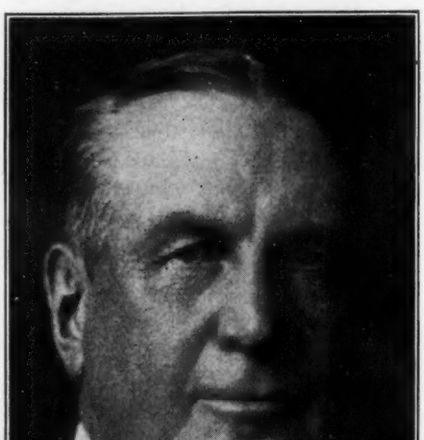
Arthur H. Jones, head of the Jones Machinery Co., Atlanta, Ga., died recently at his home in Atlanta. He was 55 years old. He was at one time superintendent of the Greensboro Electric Co. at Greensboro, N. C.

C. C. Bury, president of the Turkey Knob Coal Co., Charleston, W. Va., died at Lewisburg, W. Va., where he had gone to regain his health. He was 58 years old. His company is one of the largest coke producers in the New River field.

Roy McCormick Fraser, purchasing agent for the Chandler Motor Co., Cleveland, died in Lisbon, O., July 30, following a lingering illness. Mr. Fraser, who was 32 years old, had worked to the position of purchasing agent of the company from the service department.

A. J. Sweeney, assistant to the president of the McKinney Steel Co., Cleveland, died at a hospital in that city Aug. 3 after a long illness. Mr. Sweeney, who was 48 years old, was in charge of transportation for the company. He entered the employ of the company 20 years ago.

Harvey H. Brown, prominent as an iron ore operator, pig iron manufacturer and industrial executive, died Aug. 2 at his home in Cleveland following an illness of a year from paralysis. Until nearly a year ago, Mr. Brown, who was 75 years old, had been actively engaged in business.



HARVEY H. BROWN

He was a partner in Harvey H. Brown & Co., iron ore dealers; was president of the Stewart Furnace Co., operating a blast furnace at Sharon, Pa. and chairman of the board of directors of the Brown Hoisting Machinery Co., Cleveland. He also was a director of several Cleveland banks. Mr. Brown was born in Allegheny, Pa., but in his early youth moved to Cleveland with his parents. His father who was a leader in financial and shipping circles in Cleveland during the latter half of the nineteenth century, founded the Brown Hoisting Machinery Co. After completing his education in Cleveland grade and high schools, Mr. Brown in 1878 entered business with his father the firm being known as the Harvey S. Brown Co. The company later became the Harvey H. Brown & Co. and has grown to be one of the larger iron ore interests. Mr. Brown was the father of Fayette Brown, vice president of the Stewart Iron Co. and vice president of the Ham-

ilton Furnace Co., Hamilton, O. and of Harvey H. Brown Jr., production manager of the Brown Hoisting Machinery Co. and uncle of Alexander Brown president of the Brown Hoisting Machinery Co.

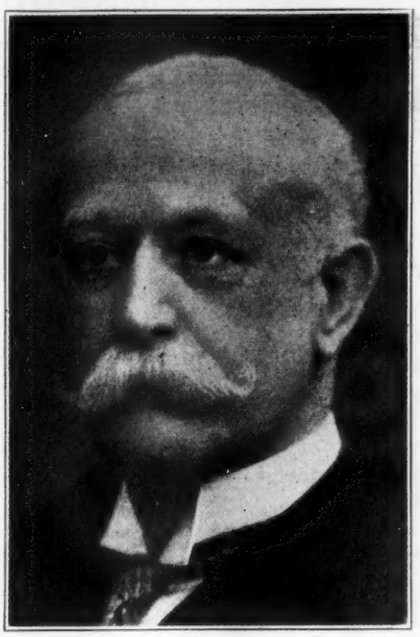
Edward Van Winkle, for many years president of the Van Winkle Gin & Machinery Co., Atlanta, Ga., died recently at a private hospital in Atlanta. He was 82 years old. Mr. Van Winkle retired from active management of the Van Winkle company some time ago, and since that time the company has operated as the Murray Co.

Charles M. Miller, treasurer of the Superior Foundry Co., Cleveland, died at his home in that city Aug. 3 following a lingering illness of four months. He was 69 years old and organized the Superior company when he came to Cleveland from Mansfield, O., 30 years ago. He was a graduate of the University of Pennsylvania.

Alex Y. Malcomson, prominent Detroit business man, and one of the original investors in the Ford Motor Co., Detroit, died in Ann Arbor, Mich., Aug. 1, following an illness of several months duration. Mr. Malcomson, who was 59 years old, played an important role in the development of the Ford company in the early days of that organization. He backed James Couzens, who was a clerk for the Malcomson Coal Co., when Mr. Couzens was sent to the Ford plant to represent the Malcomson interests. Mr. Couzens later became treasurer of the Ford company. Mr. Malcomson was Mr. Ford's original partner when the Ford company was organized, investing $7000 in the Ford project.

John Hayes McGowan, president of the John H. McGowan Pump Mfg. Co., Cincinnati, died Aug. 6 at his home in Pleasant Ridge, a suburb of Cincinnati. Mr. McGowan was 93 years old. He was the founder of the McGowan company and although he retired 20 years ago continued to assist in its management until he became ill three months ago. Mr. McGowan was born in Aberdeen, Scotland in 1830. His first position along mechanical lines was with the George L. Hanks Bell & Brass Foundry. Later he became affiliated with Nelson, Newman & Co. and it was under his supervision the first steam fire engine was built. He gained prominence for his patents and erection of force and lift pumps and remained with Nelson, Newman & Co., until the company was sold out to Ross & Ricker. For his perfection of lift pumps, Mr. McGowan in 1852 received a medal of honor from the Ohio Mechanics Institute. In 1862, with his brother T. J. McGowan, he formed a partnership which continued until 1870. In 1881 his firm was incorporated under its present name.

Edward Milton Woodward, president and treasurer of the Woodward & Powell Planer Co., Worcester, Mass., which he founded in 1887, died at his home in that city Aug. 3. He was 76 years old, being born at Marlboro, N. H. in 1846. He was president of the National Machine Tool Builders association in 1905-6 and 1906-7, being the third president of that organization. In 1908 he was president of the Worcester branch, National Metal Trades association. He was president of the Worcester chamber of commerce in 1911 and 1912 and has been active in many civic, industrial and fraternal affairs of Worcester. Mr. Woodward, received a common school education and first learned the machinists' trade in the shop of an uncle. Later he worked as a machinist with Lathe & Morse, Worcester. In 1870 he became mechanical expert at the southern headquarters of the Weed Sewing Machine Co., Baltimore, and in 1880 went to New York as salesman for E. P. Bullard, shortly thereafter becoming a partner in the firm. In 1887 the partnership was terminated and Mr. Woodward returned to Worcester, where he organizd the Powell Planer Co., now known as the Woodward & Powell Planer Co.



EDWARD M. WOODWARD

General Motors Sales Gain

General Motors Corp. reports gross sales totaling $362,819,353 for the six months ended June 30,1923. This is the largest semiannual total in the history of the corporation. In the first half 397,318 cars and trucks were sold, establishing a record for sales. After all charges and taxes, surplus available for various classes of stock was $41,585,600. General Motors' share, or 60 per cent of the undivided profits of the Fisher Body Corp. amounted to $5,889,808. After allowing for preferred and debenture dividends there was a balance of $38,179,504 available for common stock dividends.

Replogle Earnings Better

Net profits of the Replogle Steel Co., including returns of subsidiaries, for the second quarter of 1923, totaled $66,456 as compared with a deficit of $19,774 for the first quarter of this year. After reserves for depreciation and maintenance, there was a loss of $18,741 as compared with a loss of $73,759 after the same deductions in the quarter preceding. Net loss for the six months ended June 30, 1923, totaled $112,274.

More Furnaces Starting

(*Concluded from Page* 401)

auxiliary to his shipyard, is nearly completed. A furnace of 75 tons capacity will be in blast in about a month and two more will go in operation later. Part of the new stack's product will be used by the shipyard's steel rolling mill and the remainder will be placed on the market. The Penchifu Coal & Iron Co. which has supplied pig iron at the monthly rate of 2000 tons since the relighting of its furnaces will increase its output.

Some weakness has developed partly because of larger receipts of Indian and Chinese iron and because of users slackening purchases. Melters and machine builders are in an unfavorable position at present due to the tight credit situation, although the increase in furnace operations gives a better idea of makers views of the market.

In the steel market more business has been coming forward, especially from provincial parts. The government steelworks has announced its decision to accept forward orders at lower prices, although the full extent to which prices are shaded is not made public. European makers, especially Belgian, are active.

The Japanese government has announced its intention to rise the tariff on pig iron, subject to the approval of the Imperial Diet. Steel interests have started a movement to increase the tariff on steel shapes, and believe there is a possibility of success.

In the pig iron market No. 1 Japanese is quoted at 68 yen ($33.63) per ton; No. 2 at 63 yen ($31.18) and No. 3 at 60 yen ($29.70). No. 1 Hanyang (Chinese) is 63 yen ($31.18) and Cleveland (British) 85 yen ($42.07). In the steel market round bars are quoted at 4.35 ($2.15) yen per 10 kwamme (82.77 pounds). Flat bars are 4.30 yen ($2.12) per 10 kwamme, square bars 4.40 yen ($2.18); plates 4 yen ($1.98) and sheets 7.50 yen ($3.71).

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

ACQUISITION of the inventory, machinery, patents and good will of the Cox Bros. Mfg. Co., Inc., Cleveland and Albany, N. Y., has been announced by officials of the Eaton Axle & Spring Co., Cleveland. The Eaton organization operates axle and spring making plants in Cleveland and Pontiac, Mich. The Cox company manufactures automobile bumpers. It formerly was known as the Cox Brass Mfg. Co. and was established in Albany, N. Y., in 1872. In 1909 the company engaged in the manufacturing of bumpers. Under the Eaton ownership the Cox plants will continue under the direction of the Cox brothers, William G. Cox, of Cleveland, being in general charge of sales and distribution and Theodore M. Cox of Albany, in charge of production.

* * *

THE Great Western Smelting & Refining Co, Chicago, is constructing a warehouse and smelting plant on Russell street, Detroit. Mr. J. B. Newman is manager and Albert Kahn, Detroit, is architect.

* * *

REORGANIZATION of the F. W. Mann Co., Inc., Milford, Conn., maker of cutters and automobile jacks, recently was effected with the election of the following officers: President, James Reed Kimball; vice president, Lillian M. Vesey; treasurer, Philip S. Kimball and secretary, Walter B. McFarland.

* * *

THE Portland Foundry Co., Portland, Conn., has elected the following officers: President, Charles L. Warner, Milford, Conn.; vice president, Burton J. Calkins, Stratford, Conn.; secretary and treasurer, Horace C. Finkle, who are also the directors.

* * *

OFFICERS were elected at the annual meeting of the North & Judd Mfg. Co., New Britain, Conn., held recently. They are: President, Frank M. Holmes; vice president and secretary, E. M. Wightman; treasurer and assistant secretary, Samuel McCutcheon; assistant treasurer, Fred J. Ward. The board of directors consists of F. M. Holmes, E. M. Wightman, G. M. Landers, A. J. Sloper, George C. Clark, F. S. Chamberlain, Samuel McCutcheon and Noah C. Rogers, the latter being a new member.

* * *

THE Central Brake Shoe & Foundry Co., Chicago, has about half completed its $100,000 plant being constructed at 5330-42 West Sixty-sixth street, Chicago. The company, which is a new organization, will engage in the manufacture of brake shoes and will do a general foundry business. Frank Van Inwagon is president of the company.

* * *

ANNUAL meeting of the Peck, Stow & Wilcox Co., Southington, Conn., and Cleveland, was held in Southington recently and the following officers elected: President, L. E. Fichthorn; vice president, F. S. Wilcox, Hartford, Conn.; treasurer, Edwin N. Walkley; secretary, F. D. Taylor Jr. and manager of the Cleveland plant, O. J. Blank.

* * *

THE Southington Hardware Co., Southington, Conn., maker of screws and hardware, elected the following officers at its annual meeting July 24: President, James H. Pratt; secretary, William E. Smith; treasurer, Miss Frances Gridley. The old board of directors was re-elected.

* * *

THE McKenna Brass & Mfg. Co., Inc., Pittsburgh, plans the establishment of a branch office and warehouse in Atlanta, Ga., to handle the company's southern trade, according to an announcement Aug. 1 by E. C. Bastable, general sales manager. The Atlanta headquarters will be at 483 Whitehall street. The company manufactures automatic machines for filling and crowning bottles.

* * *

TO COMPLETE work which has been started the Champion Engineering Co., Kenton, O., has reopened with a force of 50 employes. The plant recently was closed as the result of a receivership arising from receivership of the Dollings interests. Work to be completed is expected to raise sufficient funds to meet back pay due employes. This work is expected to be completed the latter part of August. Future plans of the company are not known. It is the largest industry in Kenton.

* * *

THE production of an all-steel automobile truck dump body has been started at the steel plate, tank and boiler works of McNamara Bros. Co., Westport, Baltimore. At present facilities for steel fabrication limit the production to about 75 bodies a week but the demand is reaching such proportions that the company has drafted plans for the construction of a body shop at Westport. It is expected this plant will be built in the near future.

* * *

THE Parker Wire Goods Co., for many years located at 18 Grafton street, Worcester, Mass., has moved into its new factory at Washington and Larartine streets, Worcester. The personnel has been increased 25 per cent, the company having enlarged its metal stamping department and installed additional machinery in other departments. The factory contains 44,000 square feet of floor space and is the only one in Worcester which has installed the underground air current system, which draws away the acid fumes from the varnishing departments.

* * *

THE A. D. Granger Co., Park Row building, New York, has booked a 100-horsepower Oswego boiler for the Hotel Willard, 254 West Seventy-sixth street, New York; a 200-horsepower Oswego boiler complete with breeching, and 70-foot stack, for the Stevens Fuel Co., 177th street and Harlem river, New York, and an engine with line shafting and pulleys for the Kerman Rudy Renovating Co., 465 Kent avenue, Brooklyn, N. Y.

* * *

AMERICAN Steam Gage & Valve Mfg. Co., Boston, sold its Worcester, Mass., plant to the American Schaeffer & Budenberg Corp., New York, for $100,000. The purchaser is also interested in the Schaeffer & Budenberg Mfg. Co., Brooklyn, N.

Y., maker of gages and valves, which has been affiliated with the American Steam Gage & Valve Mfg. Co. The Worcester plant has been idle about two years, being last operated by the R. B. Phillips Mfg. Co., which during the war made munitions. It was built by the Crithley Machine Screw Co., maker of screw machine products, which sold it to Phillips early in the war. It is expected operations will be resumed by the new owner shortly.

* * *

CONTRACTS recently closed by the Combustion Engineering Corp., Pittsburgh, include the following: Five 15-retort stokers for installation under five 1530-horsepower boilers at the New Castle, Pa. plant of the Carnegie Steel Co.; four stokers for installation under four 500-horsepower boilers at the Camden, N. J. plant of the New Camden Coke Co.; one 2988-horsepower boiler for the Allegheny County Steam Heating Co., Pittsburgh; four 3600-horsepower boilers for the Cleveland Electric Illuminating Co., Cleveland; and five 2650-horsepower boilers for the Duquesne Light Co., Pittsburgh.

* * *

RECENT purchasers of electric furnaces from the Pittsburgh Electric Furnace Corp., include the following: Vulcan Iron Works, Ltd., Winnipeg, Canada; the Piston Ring Co., Muskegon, Mich.; the Standard Semi-Steel Foundry, Clinton, Mo.; Sutton, Steele & Steele, Inc., Dallas, Texas; Texas Steel Co., Ft. Worth, Texas; Cyclops Steel Co., Titusville, Pa.; Florida Machine Works, Jacksonville, Fla.; Baldwin Locomotive Works, Philadelphia; Bethlehem Steel Co., Chile; American Well & Prospecting Co., Corsicana, Texas; and the Eastman Kodak Co., Rochester.

* * *

MOTOR orders recently taken by the General Electric Co., Schenectady, N. Y. include the following: One 500-horsepower, 600 revolutions per minute, 2200-volt induction motor with control and switchboard for driving brass mill, for the American Brass Co., Torrington, Conn.; one 300-horsepower, 600 revolutions per minute, 2200-volt induction motor to drive cold sheet mill for the Falcon Steel Co., Niles, O.; one 500-horsepower, 600 revolutions per minute, 2200-volt induction motor with control and switchboard for driving cold-rolled brass strip mill for the Taunton-New Bedford Copper Co., Taunton, Mass.; four 250-horsepower, 488 to 800 revolutions per minute, 230-volt shunt wound direct-current motors with magnetic control for driving cold strip mill, and one 900-kilowatt motor generator and switchboard for the Griffin Mfg. Co., Erie, Pa. The General Electric Co. also received an order from the Pittsburgh & West Virginia railroad for three 750-kilowatt steam extraction type turbo generators, 3-phase, 60-cycle 2300-volt.

* * *

ONE recent export order received by the George T. Ladd Co., Pittsburgh, calls for four 900-horsepower boilers to be manufactured by the Ladd-Belleville Co. for shipment to the Societe des Fours a Coke, Homecourt, France. These boilers will utilize the heat generated in the manufacture of by-product coke. The coke is introduced into a closed chamber; a fan draws the air into the boiler and forces it into the coke chambers; the air passes through the coke and again into the boiler. At the first passage the oxygen in the air is transformed to CO-2 so that there is no combustion afterwards. Special provisions are made to secure a tight setting so that there will be no infiltration of air during the cycle.

* * *

THIS year is the ninety-fifth in the history of the large iron and steel jobbing business of Morris, Wheeler & Co., Philadelphia. The firm originally was founded in 1828 by Israel Morris, grandfather of Wm. P., Fred W. Jr., George L., C. Christopher and Reginald H. Morris, all of whom now are active members of the company. Andrew S. Wheeler is president of the company. The original site of the company's warehouse was at Sixteenth and Market streets and here the company was located for 90 years. Five years ago it completed its present large and modern warehouse at Thirtieth and Locust streets.

Building Steel Foundry

Florida Machine Works has started construction of a steel foundry to cost $200,000 at Jacksonville, Fla. Plans include the construction of four units and the installation of an electric furnace made by the Pittsburgh Electric Furnace Corp., according to F. G. Russell, head of the company. The company will be the first in Florida, Mr. Russell states, to manufacture steel castings.

Grant Receivership

F. M. Sayre, president of the Steel Fabricating Corp., recently was appointed receiver of that company following the filing of a petition in the superior court at Michigan City, Ind., by Leroy A. Wilson, a stockholder. The Fabricating corporation is involved in the affairs of the R. L. Dollings Co., of Ohio. Assets of the fabricating company, consisting of real estate, plant and equipment, are valued at $400,000, and working assets at $200,000.

Stack Breaks Its Record

During the month of July the Henry blast furnace at the River Rouge plant of the Ford Motor Co. broke its previous record for production of foundry pig iron. The average daily output of the furnace was 551 tons with a coke consumption of 1866 pounds per ton of iron. The average silicon content was 3.11 per cent. This furnace now is on the fourth year of its operation and during that time it has produced approximately 568,040 tons of foundry iron with a silicon content ranging between 3 and 4 per cent.

To Make Turnbuckles

Buffalo, July 31.—A new company known as the McArthur Turnbuckle Corp. has been formed to manufacture turnbuckles for locomotives in Salamanca, N. Y. The machinery of the Rogers Machine Co. has been purchased and some new machinery added. The premises of the Rogers company have been leased and new buildings will be added. The directors are all Salamanca men and are E. B. Fitzgerald, John Walreth, R. C. McArthur, W. J. Frederickson and A. E. Krieger. Officers have not yet been elected. The new firm is capitalized at $35,000.

Secure Contract for Cells

Contract for the fabrication and installation of 700 steel cells for the new county jail at Los Angeles at an approximate cost of $600,000 has been awarded to the Van Dorn Iron Works, Cleveland. It is claimed that the Los Angeles jail will be the largest of its kind in the country. The main structure has a tower of 14 stories of which the top five floors will be equipped with cells.

Publishes Proceedings

Publication of a full report of the official proceedings of the tenth National Foreign Trade convention at New Orleans, May 1923, has just been made. Besides containing the speeches and discussions of all sessions in full a wide range of suggestive ideas and practical information on foreign trade are to be found in the book. Among the speeches reproduced in full is that of James A. Farrell, president United States Steel Corp. on "The Shipping Situation of the World."

Machine Tool Buying at Low Point

Few Sales Were Completed During the Past Week—Railroads Continue To Inquire for a Small Number of Tools—More Inquiries Current in Used Machinery Market—Demand for Cranes Rather Quiet

BUYING of machine tools and shop equipment during the past week has been light, the slack summer period continuing. In all districts the sales are confined practically to single installations, orders calling for over two or three tools being the exception. In the Chicago district the railroads are leading in the buying of equipment, and are followed by the pressed metal manufacturers. A few tools were sold to railroads in Pittsburgh and New York. Demand for oil field equipment for use in the vicinity of San Francisco has dropped off almost entirely. Little buying is being done by the automotive manufacturer at present, but it is expected that some replacement tools will be purchased in the fall.

However the number of inquiries brought out during the week has shown a substantial increase over the lists brought out during the preceding week. Dealers are working on this prospective business and are led to believe that this increase is indicative of a better general market condition in the relatively near future. The inquiries current continue to call for a small number of tools. Among the railroads inquiring for tools are included the Chicago, Burlington & Quincy, the Elgin, Joliet & Eastern, the Louisville & Nashville, and the Norfolk & Western. It is reported that the Pennsylvania is closing on its recent inquiry for the Pittsburgh district and also for the Columbus, O. shops. The Nashville, Cincinnati & St. Louis and the Georgia, Florida & Alabama each purchased a steam hammer during the week.

A slightly better condition is found in the second-hand machinery market, with buyers closing on inquiries a little more promptly. At the same time inquiries continue to be brought out in good volume. While a few fair sized lists are before this market, the bulk of sales are confined to orders consisting of one or two tools.

Demand in the crane market is rather quiet, although several good orders were received during the week. The steel mills are active in this market.

Most Sales Involve Only Single Machines

NEW YORK, Aug. 7.—The purchase of several machine tools by the Southern railway is a feature of the local equipment market. Orders include a 42-inch planer, two 44-inch boring mills, two side wheel boring mills, one 400-ton car wheel press and one car wheel borer, all going to one builder.

Other awards include a 6-foot boring mill for the American Laundry Machinery Co., Cincinnati, a 3500-pound steam hammer for the Nashville, Cincinnati & St. Louis; and a 1500-pound steam hammer for the Georgia, Florida & Alabama. Included in new inquiry is a small list for the Norfolk & Western railroad as reported in these columns last week.

While considerable demand is pending there is little new inquiry, and considering the situation as a whole, the market is rather listless. Several scattered orders for export are again noted. One seller reports the sale of two engine lathes for South America and one engine lathe and one radial drill for Cuba. Although business is not as large as last week, the crane market continues fairly active.

Expect Buying to Increase

MILWAUKEE, Aug. 7.—Dealers are finding a more active market for metalworking equipment than manufacturers, as there is fair trade in single items and small miscellaneous lots, new and used. Large round-lot customers have not yet resumed buying activity after the usual midsummer period of slow buying. This, it is believed, will come shortly, as the demand for the past six to eight weeks has been low. All dealers are confident that business is bound to revive with shops entering the fall and winter season in possession of enough facts to make it possible to lay out and adopt operating schedules for some months ahead. There has been little change in prices.

Calendar and Selected News of Plant Liquidations, Wholesale Offerings, Auctions of Used and New Equipment, Etc., Page 94, Classified Machinery Section.

Little Activity Shown

BOSTON, August 7.—Dullness in the general tone of business in New England finds its full reflection in the machine tool business. Dealers report the smallest volume of business in the past week or ten days of any corresponding period this year. Stocks of tools are generally low, some dealers claiming that including sample machinery they are carrying only half of their usual inventory. Buyers are postponing purchases. Local interests in the trade are inclined to believe that September will see some of this business placed and that a gradual increase will take place during this month.

Considerable second hand machinery has been offered, but it is a question whether much has been sold. One prominent dealer reports that fewer replies were received from one list sent out last week than ever before. Despite the dullness there is no disposition to alter prices. Among the sales this week are a half dozen sensitive drills, three-quarter inch, to some textile interests. A large electrical manufacturer has purchased a 50-inch lathe and a large squaring shear.

Market Continues Quiet

CLEVELAND, Aug. 7.—Business in the machine tool market in this territory is continuing at the same slackened pace as has been noted during the past two months. Sales during the past week have been light, and in a majority of cases confined to one or two tools. Buying is divided among practically all of the industries using tools, with the one exception of the automo-

tive industry where little activity is being shown. Inquiries are coming out from time to time at about the same rate as reported last week.

No new railroad inquiries are current in this market. However it is understood that the Pennsylvania has started to close on some of the equipment asked for in recent inquiries. This machinery is to go to shops in the Pittsburgh district and also to the Columbus, O. shops. The Norfolk & Western has taken no action on its recent inquiry.

While little increase is noted in the volume of sales in the second-hand machinery market, a satisfactory increase in the number of inquiries is noted. This picking up in inquiries has caused dealers to anticipate a general picking up of business in the early fall. No large sales are reported for the week.

The sale of cranes is only at a fair rate. Inquiries for various types of cranes are coming from the steelworks in this territory.

Buying Still Meager

CHICAGO, Aug. 6.—Machine tool buying in this district continues quiet. Recent inquiry from industrial concerns has further declined until at present both inquiry and orders from this source are exceptionally dull. Such inquiry for cranes as has been out during the past few weeks now appears to be inactive. One Illinois manufacturer closed on several small hoists and miscellaneous orders for hoists and hoisting equipment and power plant appliances continue to be placed along fairly normal lines.

The chief buyers in the new machine tool market here continue to be the railroads, which during the past week have picked up perhaps a dozen tools from the various dealers. The railroads also offer the most encouragement for future business. The Chicago, Burlington & Quincy is in the market with a new list and the Elgin, Joliet & Eastern is in the market with an attractive tool inquiry. Several other railroads are rounding out new lists and are expected to come into the market during the present month.

Next to the railroads stamped metal manufacturers are most conspicuous in the market. Several specialty manufacturers have placed orders for presses during the past week. One of these, a metal toy manufacturer, is expected to buy other equipment during the coming week. Prices of new tools are unchanged. Used equipment is moving slowly at low prices.

Buying Is Lacking

PITTSBURGH, Aug. 7.—Sizable buying in the machine tool and equipment trade is lacking although sellers all are busily engaged upon prospective business of an extensive nature. One prominent seller reports that the past week was the most quiet one in about 18 months. Others are selling small equipment, mostly one or two tools at a time. One dealer here sold two fair sized lathes this week and one large woodworking machine. Judging by the number of inquiries before dealers, both actual and tentative, a good buying movement is scheduled for the fall. While the Pennsylvania railroad is reported to have bought some small items in Philadelphia for Harrisburg, Pa., no buying is noted as yet on the list for shops in the Pittsburgh district.

In connection with used machinery, buyers are closing up more promptly, and in proportion to the number of inquiries there are more buyers than usual, due to the fact that so many do not issue formal inquiries but make personal calls upon the dealers. Recent sales comprise a large trimming press and a 6-spindle nut jabber. One of the sev-

Crane Awards and Inquiries of the Week

Orders Placed

One 40-ton, 30-foot span electric traveling crane and one 20-ton, 26-foot span, 2-motor electric traveling crane for the Northern New York Utilities Co., New York, to the Northern Engineering Works, Detroit.

One 5-ton, 3-motor electric traveling crane and one 1-ton, 1-motor electric traveling crane for Jenkins Bros., New York, to the Northern Engineering Works, Detroit.

One 25-ton, 3-motor electric traveling crane and one hand power electric traveling crane for the Detroit Edison Co., Detroit, to the Northern Engineering Works, Detroit.

One 10-ton crane for the Killbuck Standard Gravel Co., Mansfield, O., to the McMyler-Interstate Co., Bedford, O.

One 35-ton crane for the Pine Ridge Coa Co., Detroit, to the McMyler-Interstate Co., Bedford, O

One 20-ton locomotive crane for the United Fruit Growers' express, Washington, D. C., to the Browning Co.

One 20-ton, 1-motor crane, 47-foot span, for the Texas Co., 17 Battery place, New York, to the Niles-Bement-Pond Co.

One 12-ton handpower crane, 21-foot span, for Guatemala, placed through the Phoenix Utility Co., 71 Broadway, New York, with Alfred Box & Co.

One 20-ton handpower crane, 40-foot span, for export, placed by the General Electric Co., Schenectady, N. Y., with the Whiting Corp.

One 200-ton locomotive hoist for the Central of Vermont railroad to the Whiting Corp.

Two 15-ton handpower cranes for the Central Maine Power Co., Augusta, Me., to the Whiting Corp.

One 3-ton electric crane, 57-foot span, and one 5-ton electric crane with 56-foot span, for the Westinghouse Electric & Mfg. Co., East Pittsburgh, to the Whiting Corp.

One 75-ton electric crane, 51-foot span, for the Illinois Electric Co., Chicago, to the Whiting Corp.

One ladle crane for the General Electric Co., Schenectady, N. Y., to the Whiting Corp. This is in addition to the crane they reported last week.

One 3-ton, single I-beam crane, 38-foot span, 2-motor, for the Rubberoid Co., New Brunswick, N. J., to the Shepard Electric Crane & Hoist Co.

Three 30-ton locomotive cranes, 50-foot boom, for the Central Railroad of New Jersey, reported placed last week, went to the Ohio Locomotive Crane Co.

One 30-ton locomotive crane for the Phoenix Utility Co., 71 Broadway, New York, to the Brown Hoisting Machinery Co.

Four electric overhead cranes for the Bethlehem Steel Co., reported last week as placed with the Alliance Machine Co.

Four 2-ton hoists and four 1-ton hoists for the American Car & Foundry Co., New York, reported placed with the Detroit Hoist & Machinery Co.

One 10-ton electric crane, cage controlled, for the Cape Ann Anchor & Forge Co., Gloucester, Mass., to the Chesapeake Iron Works.

One 15-ton locomotive crane for the Great Northern Railroad Co., at Portland, Oreg., to Browning Co.

One 16-ton gantry crane with two trolleys for the Coos Bay Lumber Co., to the Cyclops Iron Works, San Francisco.

One 5-ton traveling overhead crane for Steel Tank & Pipe Co., West Berkeley, Cal., to Pratt & Whitney.

One 2-ton single I-beam crane for the Mitchell Machine Shop, San Francisco, to the Cyclops Iron Works.

One 10-ton creeper type locomotive crane for the Western Reinforced Concrete Pipe Co., Los Angeles, to the Northwest Engineering Works.

Several cranes for the Lehigh plant of the Bethlehem Steel Co., to the Alliance Machine Co., Alliance, O.

One large gantry crane for the General Electric Co., to the Alliance Machine Co., Alliance, O.

One 5-ton trolley from the Standard Gauge Steel Co., Beaver Falls, Pa., to the Cleveland Crane & Engineering Works, Wickliffe, O.

One 5-ton special crane for the Standard Gauge Steel Co., placed Aug. 2 with the Alliance Machine Co., instead of in July, as previoulsy reported.

One 2-ton monorail hoist, floor operated, for the Standard Gauge Steel Co., Beaver Falls, Pa., to an unnamed manufacturer.

One 5-ton, 3-motor crane with 70-foot span for the Kellogg Structural Steel Co., Buffalo, through the Pittsburgh office of the Milwaukee Electric Crane & Mfg. Co., Milwaukee.

Orders Pending

One 5-ton, one 3-ton and one 2-ton electric crane, 38-foot span, for export; inquiry issued through Andrews & George Co., 50 Church street, New York.

One 50-ton crane, 32-foot span, for the Manila railways, 17 Battery place, bids asked.

One 1½-ton monorail system with hand hoist, for the Charles Hvass Co., Inc., 430 East Nineteenth street, New York, bids asked.

One 5-ton handpower crane, 40-foot, 6-inch span, for the Honolulu Iron Works, Woolworth building, pending for export.

One 10-ton traveling crane with 40-foot boom, gasoline driven, for the board of public works, Seattle, bids opened Aug. 10.

One 20-ton electric crane, 23-foot, 8-inch span, 3-ton auxiliary hoist, for the Fitzgibbons Boiler Co., Inc., 47 West Forty-second street, N. Y., bids asked.

One 25-ton and one 40-ton electric overhead crane, for the Stone Mountain, Mich., plant for the Ford Motor Co., bids closed by Stone & Webster, Boston.

One 7½-ton gib crane, with alternate on 5-ton jib crane export. Inquiry issued through Wonham, Bates & Goode Trading Corp., 251 Fourth avenue, New York.

One 10-ton crane, 50-foot span, and one 5-ton, 30-foot span, for export, inquiry issued by Mitsui & Co., 65 Broadway, New York.

One 30-ton locomotive crane for the Western Pacific railroad; bids being received.

Three 15-ton locomotive cranes for the Northern Pacific railroad for use on the Pacific coast. Bids being received at Chicago.

One 15-ton, electric traveling crane with 3-ton auxiliary hoist for the Puget sound navy yard, bids up to Aug. 15 by bureau of yards and docks, navy department, Washington, D. C.

One 10-ton creeper type locomotive crane for the city of Los Angeles. Bids opened on July 27 but no award as yet made.

eral inquiries out here for used equipment comprise a boring mill, a large lathe and a horizontal boring mill. Two or three other small inquiries are out including one for three large tools. The majority of inquiries, however, are for single installations.

The crane market is quiet, only one or two orders being noted, the largest of which was taken by the Alliance Machine Co., for several cranes for the Lehigh plant of the Bethlehem Steel Co. It also received an order from the General Electric Co., for a large gantry crane. A few crane inquiries are pending although new ones are scarce.

Inquiries Fairly Numerous

CINCINNATI, O., Aug. 7.—While demand for machinery is not large inquiries are in such volume as to lend the market an atmosphere of optimism. The orders being placed, in practically all instances are for single tools and inquiries are of the same character but the latter are exceptionally numerous. Only a few sales were completed during the week, confined in the main to one or two small tools. While some plants are operating on stock orders, there is little manufacturing of machine tools for speculative purposes. On the other hand, a majority of the manufacturers are building a minimum amount of machine tools in order to keep their plants in operation. The industry is not in want of skilled mechanics, in fact one or two plants have laid off men.

Demand for used equipment also has eased off. A number of railroads have inquiries before the trade, on which action is expected to be taken at any time. The Louisville & Nashville railroad is in the market with a small list. The Newport Rolling Mill Co., has completed the installation of a new pickeling machine in the galvanizing department.

Western Business Slumps

SAN FRANCISCO, Aug. 4.—During the past three or four weeks little of outstanding importance has transpired in the local market for cranes. Only five awards have been reported. Crane men report that inquiries are light and coming from scattered sources.

Both sales and inquiries for machine tools and machinery and shop equipment during the past month have been of small proportions and at a rate much below that of April and May of this year. Dealers attribute the quietness of the market to the fact that this is the vacation period. Sales have been confined almost entirely to small tools and equipment and with the exception of a list recently purchased by the Union Pacific railroad in Chicago for its shops at Los Angeles, single installations only have been made. Due to the curtailing of production in the oil fields demand coming in from manufacturers of oil well equipment for oil country lathes and hammers has practically ceased. Used equipment is in much better demand than is the new, but sales in this line have involved small installations only. The outlook for the balance of the year is good.

Bulletin Board

Requests for Equipment and Supplies, Trade Literature, Etc., Made Through IRON TRADE REVIEW

The Crown Mountain Mining & Mfg. Co., Dahlonega, Ga., is in the market for considerable mining, transportation, smelting, power plant, electrical and other equipment necessary for the refining and treating of various kinds of ores.

* * *

The Hamilton Co., 829 East Fifteenth street, Brooklyn, is in the market for about 1000 *pounds of Swedish iron sheets* .015 *or* .020 *inches thick in a size sheet that will cut out* 15 *x* 19 *inches to advantage.*

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

ANSONIA, CONN.—The U. S. Metal Goods Co. has been incorporated to make metal goods with $50,000 capital by John E. Peterson, Waterbury, Conn., G. E. Davenport, R. W. Daly and J. F. Bennett.

BRIDGEPORT, CONN.—The Hawie Mfg. Co. has been incorporated to make metal goods with a capital stock of $10,000 by Michael Hawie, W. D. Grout, New Haven, Conn., and G. S. Hawie.

BRIDGEPORT, CONN.—The Hawes Mfg. Co. has been incorporated to make tools and hardware with $25,000 preferred stock and 250 shares of common stock without par value by David H. Hawes, William C. Buckelew and H. E. Lees.

BRISTOL, CONN.—Bids were closed Aug. 7 on a steel and concrete bridge over the Pequabuck river, for this city.

CANTON, CONN.—The machine shop of Whitney Bros., Hartsville, Conn., near here, recently was damaged by fire.

HADDAM, CONN.—The Cutaway Harrow Co., Inc., recently was incorporated with $75,000 capital stock by E. S. Hubbard, A. H. Hubbard and E. Raymond Austin, all of Higganum, Conn.

HARTFORD, CONN.—The American Thermos Bottle Co. contemplates the erection of a plant.

NORWALK, CONN.—Whitney & Lockwood, Inc., has been incorporated to make automobile accessories with $50,000 capital by Irving E. Whitney, Ellsworth C. Lockwood and B. M. Whitney.

PLAINVILLE, CONN.—The Standard Steel Bearings, Inc., plans to erect a 1-story power house.

STAMFORD, CONN.—The Norma Co. of America is having plans drawn for the erection of a plant, 160 x 325 feet.

WATERBURY, CONN.—The American Brass Co. has let the contract for a 1-story, 75 x 208-foot garage to cost $25,000.

WATERBURY, CONN.—The Scovill Mfg. Co. plans to erect a 1-story factory addition, 32 x 165 feet, at an estimated cost of $47,000.

WATERBURY, CONN.—The French Mfg. Co., small tubing and rods, has let the contract for a 1-story, 72 x 120-foot addition to cost $26,000.

CHICAGO—The Fire Pump & Equipment Co. has increased its capital stock from $2000 to $10,000.

CHICAGO—The Chicago Steel & Wire Co., 10257 Torrence avenue, contemplates the erection of a plant extension.

CHICAGO—The Mulvey Iron Works, 1840 Carroll avenue, plans the erection of a 2-story factory building, 103 x 406 feet.

CHICAGO—The Ellicott Varnish Co. plans the erection of an addition to its plant, two stories, 75 x 85 feet.

CHICAGO—W. Gartner & Co., 5345 Lake Park avenue, plans the erection of a 2-story factory building, to be built at an estimated cost of $150,000.

CHICAGO—The Dynamic Mfg. Co., 38

Do You Realize

that this country is almost the only progressive country that does not use recuperators generally?

What CALORIZING Does

The process of Calorizing drives aluminum into metal surfaces so as to form an aluminum alloy. In use this alloy develops an aluminum oxide on the surfaces which immediately renders the tube resistant to the action of oxidizing, reducing or sulphur gases.

Calorized tubes are good for applications in temperatures up to 1650° F. (bright orange heat), which means that the heating gases may be well in excess of 2000 degrees F.

The coupon brings a sample.

CALORIZED RECUPERATORS can readily be applied to the great majority of furnaces, large or small, old or new. And they are strictly in a class by themselves for durability.

In France, Sweden, Germany and Belgium, they use ordinary iron tubes for recuperators and let them burn out. Even this is much cheaper than to waste the fuel. Still how much cheaper than it is to use Calorized Tubes that will give multiple service! The value of Calorized Recuperators has become so great that it is safe to say that in a *very short time* practically all furnaces will be installed with them.

Flue gases contain a definite quantity of heat, based on the fuel burned per hour and the temperature of the gases. A

CALORIZED Recuperator

simply and positively retrieves the greater part of this waste heat and utilizes it to heat the air that is burnt with the fuel. This not only guarantees better flame control and better combustion, but also *reduces the fuel consumption at least 20%*.

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CLIP THIS COUPON

Information which will enable me to determine the fuel I can save with a Calorized Recuperator interests me.

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Company Name:_____

Address:_____

South Dearborn street, has been incorporated with 100 shares of no par value to manufacture machinery, etc., by E. G. Lindsey, Charles G. Bartlett and I. S. Bartlett. The company is represented by Charles G. Bartlett, First National Bank building.

CHICAGO.—The Rempe Co., 340 Sacramento boulevard, has been incorporated with $150,000 capital stock to manufacture and deal in pipe coils, iron supplies, etc., by D. Goldstandt, L. Reinholdsten, and H. M. Hansen. The company is represented by Sonnenschein, Berkson, Lautmann & Levinson, Chicago Temple building.

CHICAGO.—The Broadcaster Corp., 312 Union Park Court, has been incorporated with $125,000 capital stock to manufacture and deal in talking machines, etc., by Aaron M. Meltzer, Saul M. Meltzer, Sol L. Zax and Max Revesh. The company is represented by Ferel, Saltiel & Ferel, 105 West Monroe street.

CHICAGO.—The Stewart Metal Products Co., 729 Milwaukee avenue, has been incorporated with $50,000 capital stock to manufacture and deal in metal goods, etc., by Norman S. Florscheim, Leonard E. Florscheim and William J. Stewart. The company is represented by Mayer, Mayer, Austrian & Platt, Continental & Commercial Bank building.

CHICAGO.—H. A. Brassert, Inc., 122 South Michigan avenue, has been incorporated to design, consult, supervise in the construction of iron and steel plants, coke ovens, coal and ore mines, quarries, etc. It has a capital of 500 shares of no par value and incorporators are Arthur B. Markus, E. L. Ives and Thomas G. Deering. The company is represented by Thomas G. Deering, 208 South La Salle street.

CHICAGO HEIGHTS, ILL.—The Calumet Steel Co. plans the erection of a building, 75 x 450 feet.

DANVILLE, ILL.—The Modern Machine Shop plans the erection of a 2-story machine shop addition, 75 x 150 feet. C. F. Carter is president of the company.

MOLINE, ILL.—A. E. Hagenboeck, 115 Twenty-first street, plans a foundry building, one story, 40 x 90 feet, to be built at an estimated cost of $10,000.

EVANSVILLE, IND.—The Hedderich Bros. Co. is building a 1-story addition to its brass foundry, 60 x 60 feet.

FT. WAYNE, IND.—The Chalfant Can Co., 1966 South Meridian avenue, Indianapolis, plans the erection of a 2-story plant here.

FT. WAYNE, IND.—The Wayne Tank & Pump Co. plans the construction of a factory building.

INDIANAPOLIS—The Tucker & Dorsey Mfg. Co., State and Bates street, plans the erection of a 1-story addition to its power house.

INDIANAPOLIS.—The Thomas Steel Products Co. is remodeling a building at 225-227

Live Tips That Count

FOR business tips, do not overlook the weekly listings of awards and inquiries of structural steel and reinforcing bars. These items mark a definite and highly important stage in the development of a structural project. An inquiry indicates that the tentative and formulative stages, which necessarily cover weeks, oftentimes months, have been passed; an award, signifies even more clearly the certainty of the work going ahead and that actual construction is close at hand. The statement of tonnage affords an accurate index to the size of the project, and what is possibly the most important, new projects come to light for the first time in the structural and reinforcing bar markets. In this issue, these items classified and arranged in a compact and easily readable fashion, appear on pages 362 and 360, respectively.—The Editor.

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.515c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Cleveland	3.36c
Detroit	3.35c
Los Angeles	4.30c
New York	3.54c
Philadelphia	3.55c
Pittsburgh	3.15c
San Francisco	3.75c
Seattle	4.10c
St. Louis	3.35c
St. Paul	3.45c

IRON BARS

Boston	3.515c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Detroit	3.35c
New York	3.54c
Philadelphia	3.55c
St. Louis	3.35c

SHAPES, STRUCTURAL

Boston	3.615c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Los Angeles	4.40c
New York	3.64c
Philadelphia	3.65c
Pittsburgh	3.25c
San Francisco	3.60c
Seattle (large shapes)	4.20c
St. Louis	3.45c
St. Paul	3.55c

PLATES

Boston	3.615c
Boston 3/16-inch	3.04c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Detroit, 3/16-inch	3.45c
Los Angles	3.65c
New York	3.64c
Philadelphia	3.65c
Philadelphia, 3/16-inch	3.95c
Pittsburgh	3.25c
San Francisco	3.75c
Seattle	4.25c
St. Louis	3.45c
St. Paul	3.55c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.615c
Buffalo	4.45c
Chicago	4.35c
Cincinnati	4.10c
Cleveland	3.75c to 4.06c
Detroit	4.30c
Los Angeles	5.20c
New York	4.59c
Philadelphia	4.25c
San Francisco	5.25c
Seattle	5.00c
St. Louis	4.45c
St. Paul	4.60c

NO. 28 BLACK SHEETS

Boston	5.45c
Buffalo	5.25c
Chicago	5.20c
Cincinnati	4.90c
Cleveland	4.65c
Detroit	5.15c
Los Angeles	6.50c
New York	5.15c
Philadelphia	5.15c
San Francisco	5.80c
Seattle	5.75c
St. Louis	5.30c
St. Paul	5.45c

NO. 28 GALVANIZED SHEETS

Boston	6.60c
Buffalo	6.35c
Chicago	6.35c
Cincinnati	5.90c
Cleveland	5.60c to 5.80c
Detroit	6.30c
Los Angeles	7.30c
New York	6.05c to 6.15c
Philadelphia	6.25c
San Francisco	6.50c
Seattle	6.75c
St. Louis	6.45c

BANDS

Boston	4.80c
Buffalo	4.35c
Chicago	3.95c
Cincinnati	4.00c to 4.10c
Cleveland	4.01c to 4.16c
Detroit	4.10c
Los Angeles	5.20c
New York	4.39c
Philadelphia	4.35c
Pittsburgh	3.95c
San Francisco	4.50c
Seattle	5.10c
St. Paul	4.20c

HOOPS

Boston	5.80c
Buffalo	4.65c
Chicago	4.55c
Cleveland	4.01c to 4.16c
Detroit	4.95c
New York	5.19c
Philadelphia, 1 inch and wider 20 gage and heavier	4.75c
Pittsburgh	3.95c
Seattle	5.50c
St. Paul	4.80c

COLD ROLLED STEEL

Boston (rounds)	4.75c
Boston (shapes)	5.25c
Buffalo (rounds)	4.70c
Buffalo (shapes)	5.20c
Chicago (rounds)	4.55c
Chicago (shapes)	5.05c
Cincinnati (rounds)	4.50c
Cincinnati (shapes)	5.00c
Cleveland (rounds)	4.25c
Cleveland (shapes)	4.75c
Detroit (rounds)	4.55c
Detroit (shapes)	5.05c
Los Angles (rounds)	5.90c
New York (rounds)	4.65c
New York (shapes)	5.15c
Philadelphia (rounds)	4.35c
Philadelphia (shapes)	4.85c
Pittsburgh	4.25c
San Francisco (rounds)	5.75c
Seattle (rounds)	6.00c
St. Paul (rounds)	4.55c

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includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

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If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

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East Empire street, which it will utilize for the manufacture of steel products.

INDIANAPOLIS—C. A. Bradford plans to establish a 1-story machine shop here at 570 North Belleview place.

KOKOMO, IND.—The plant of the Kokomo Steel & Wire Co. recently was damaged by fire.

PADUCAH, KY.—The Michael Ferguson Hardware Co. has plans for the erection of a 1-story factory building, 115 x 150 feet.

BANGOR, ME.—The Acme Mfg. Co. plans the erection of a 1-story factory building.

BOSTON—The Alloys Corp. has been incorporated to deal in metals with $25,000 capital by John F. Gabel, Malden, Mass., Charles T. Kellough and Charles R. Lawrence, Belmont, Mass.

BOSTON—The Johnson Mfg. Co. has been incorporated to build motor vehicles with $25,000 capital by Jason A. H. Johnson and William J. Johnson, both of Framingham, Mass., and Stephen R. Casey.

BROCKTON, MASS.—The Brockton Perforating Machine Co. has been incorporated with $30,000 capital by Joseph C. Knight, Edmond A. Hebert, Brooksville, Mass., and Norman L. Brock, Bridgewater, Mass.

FITCHBURG, MASS.—The Simonds File Co. has obtained a permit to erect an addition to its plant, 28 x 60 feet.

GARDNER, MASS.—The Central Oil & Gas Stove Co. has let the contract for a 1-story, 60 x 160-foot additional factory building to H. K. Ferguson Co., 4900 Euclid avenue, Cleveland.

LOWELL, MASS.—The Try-on Knitter Corp. has been incorporated to build machines with $25,000 capital by Richard B. Conway, K. A. Walsh and Edward R. Tryon.

LOWELL, MASS.—The McClintic-Marshall Co., Pittsburgh, is low bidder for making structural changes in the brick and steel, 1-story foundry building of the Saco-Lowell Shops.

LYNN, MASS.—The Wyoma Brass Foundry has been organized to make bronze and aluminum castings at 120 Broadway, by Anna and George Seidler.

NORTH ATTLEBORO, Mass.—The Standard Chain Co. has been incorporated with a capital stock of $20,000 by Charles J. Rancourt, Odin Smith, Attleboro, Mass., and M. Joseph Brohen.

QUINCY, MASS.—The Colburn Gear & Mfg. Co., 98 Holmes street, plans the erection of a 1-story machine shop.

WORCESTER, MASS.—The Hope Machine Co., Inc., has let the contract for a 1-story, 67 x 150-foot addition to cost $50,000.

BALTIMORE—The Porcelain Enamel & Mfg. Co. has awarded the P. C. Street Engineering Co., 406 St. Paul street, contract for the erection of a plant building.

BALTIMORE, MD.—The Reliance Pump & Machine Co. has recently organized with capital of $500,000 for the manufacture of pneumatic pumps. E. J. D. Cross is an incorporator.

POCOMOKE, MD.—The Marvil Package Co. plans the erection of a 1-story warehouse, 50 x 160 feet.

BENTON HARBOR, MICH.—The R. B. Collis Sprayer Co., 190 Territorial avenue,

Foreign Makers Bid

THE sharp competition afforded American crane builders by foreign makers is reflected in the following 15 bids, recently submitted on two 5-motor, 22-ton cranes, 52-foot span for the Central Railroad of Brazil. The bids are on the basis of c.i.f. Rio de Janeiro.

Fonseca Almedia & Co. (The Bedford Engineering Co., England)	£2,415-0-0
Mayrink Veiga & Co. (Paul Ryermann, Berlin)	£1,675-0-0
The Baldwin Locomotive Works (Niles-Bement-Pond)	$15,585-0-0
Dias Garcia & Co. (Graham Bros. Aktieboloog)	Rs,119,000,000
Raymundo Luio (Paul Weyermann, G. M. b. h.)	£1,541-10-0
Amaro da Silveira (Soc. des E. G. Houplain, Franca)	Fcs.11,465
Henrique C. de Mendonca (Carl Flohr A. G. Berlin)	£1,945-0-0
Scares Sampaio (Deutsche Machinenf A. G.)	£1,965-0-0
Cia B. de Electric Siemens Schuckertwerke)	Rs,66,170,000
Wheatley & Blake (Stothert & Pitt—Bath, Eng.)	£2,052-0-0
Irmaos Allard (Willebroek, Belgium)	Fcs.109,000
Herm. Stoltz (Ardeltwerke, G. M. B. H.)	£1,475-0-0
F. de Siquera Co. (Rhein Metalwund Machinuf)	£1,771-0-0
International Machinery Co. (Whiting Corp.)	$15,625.00
Mario Simmonsen (Le Titan Anversois, Belgium)	Fcs.153,800

Industrial Business Changes Recently Announced

MANUFACTURE of steel wheels will be discontinued at the plant of the Midland Steel Co., Detroit, after Aug. 1, and thereafter will be produced at the plant of the Motor Wheel Corp. at Lansing, Mich., which company purchased the property of the Disteel Wheel Co. some months ago. The Disteel Wheel Co. will retain its sales office at Detroit.

* * *

The Motor Tool Specialty Co. has opened a salesroom at 613 North Illinois street, Indianapolis.

* * *

The Hawie Buckle Mfg. Co., Bridgeport, Conn., has changed its name to the Hawie Mfg. Co.

* * *

The Bethlehem Steel Corp. has moved its Philadelphia district sales offices from the Morris building to the Widener building.

* * *

The Columbia Steel Corp., San Francisco, has opened offices in the Pacific Electric building, Los Angeles, and J. M. Fitzhugh, formerly of the Llewellyn Iron Works at the Torrance plant, has been appointed manager.

* * *

The Minneapolis Steel & Machinery Co. has opened offices in the C. C. Chapman building, Los Angeles, with M. H. Hanauer in charge.

* * *

The Colorado Fuel & Iron Co. has re-established an office in Los Angeles in the A. G. Bartlett building, with J. R. Lemist in charge.

* * *

The main office of the Torrington, Conn., branch of the American Brass Co. is to be moved to Waterbury, Conn., about Aug. 18.

* * *

The General Electric Co., Schenectady, N. J., has announced the opening early this month of its southern warehouse in Atlanta, Ga. The plant provides 64,000 square feet of floor space.

* * *

Manning, Maxwell & Moore, Inc. have changed their New York offices from 119 West Fortieth street to the Pershing Square building, 100 East Forty-second street.

* * *

Luria Bros., scrap dealers, are opening a branch office in the Franklin Trust building, Philadelphia. A. L. Luria, president and Max Silverman, vice president, will spend considerable of their time at this office.

* * *

On Aug. 1 the general sales office of the Keokuk Electro-Metals Co. was moved to Keokuk, Iowa, from Chicago, where the executive offices and furnaces are located.

* * *

The Stroh-Ilgenfritz Co., Stambaugh building, Youngstown, O., recently was appointed sales agent in that district for the Brighton Fire Brick Co., New Brighton, Pa.

* * *

Kyle & Co., Call building, San Francisco, representative on the Pacific coast for the McClintic-Marshall Co. and the Riter-Conley Co., has opened offices in the I. W. Hellman building, Los Angeles, with W. S. Kyle in charge.

A Special Material Specially Treated for

VITREOUS ENAMELING

STOVE DOOR PANELS
SPLASHER BACKS
BROILER PANS
TABLE TOPS
REFRIGERATORS
SIGNS
and other flat work

WABIK METAL

Like all other Mansfield Products, WABIK METAL SHEETS are rolled from our own special "BOTTOM-POURED" INGOTS.

SHEET BARS INGOTS

Other Specialties:—

AUTOMOBILE SHEETS

Body Stock; Flat Fender and Hood Stock; Cowl Stock; Radiator Casing Stock; Crown Fender Stock.

METAL FURNITURE SHEETS

PICKLED and ANNEALED ENAMELING STOCK

For Kitchen Utensils

MILK CAN STOCK

"Mansfield" Steel is the ultimate in Sheet Bars and in Sheets. It means satisfaction to the many users. Constant study of the needs of users, and continuous application of the results of such study, in the way of improved methods in our plants has established a reputation for reliability unsurpassed.

Mansfield Sheet & Tin Plate Company

MANSFIELD, OHIO

DISTRICT SALES REPRESENTATIVES

The L. D. Rockwell Co., 1106 National City Bldg., New York, N. Y.
Mr. D. B. Coey, 1018 Standard Oil Building, Chicago, Ill.
Mr. Geo. W. House, 1822 Ford Building, Detroit, Mich.
The L. D. Rockwell Co., 1512 B. F. Keith Bldg., Cleveland, Ohio.
The Maynard French Steel Co., 516 Mercantile Library Bldg., Cin., O.
Walter G. Clark, Inc., 215-17 Chestnut St., St. Louis, Mo.
Walter G. Clark, Inc., 1317-19 St. Louis Ave., Kansas City, Mo.
Mr. C. H. Beach, 617 Merchants Bank Bldg., Indianapolis, Ind.
Mr. A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.
Mr. Herbert P. Hill, 401 Continental Trust Bldg., Washington, D. C.
Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.
Wm. P. Horn Co., 301 Kerchoff Bldg., Los Angeles, Cal.
Wm. P. Horn Co., Dekum Building, Portland, Ore.
Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.
Mr. Edwin Schofield, 45 Jarvis St., Toronto, Ont., Canada.

plans the erection of a plant building, two stories, 50 x 125 feet, to be built at an estimated cost of $25,000.

FLINT, MICH.—The Mason Motor Co., Fenton road, plans the erection of an addition to its plant. M. C. Day is secretary and treasurer of the company.

SAGINAW, MICH.—The Jackson & Church Co., 321 North Hamilton avenue, plans the erection of a plant addition. John L. Jackson is president of the company.

STURGIS, MICH.—The Kirsch Mfg. Co. contemplates the erection of a 3-story factory building.

NEWARK, N. J.—The New Jersey Commercial Body Co. plans the erection of a 1-story plant building, 100 x 280 feet, to be built at an estimated cost of $60,000.

ALBANY, N. Y.—John D. Parsons, Inc., 93 North Pine avenue, manufacturer of store fixtures, etc., plans to rebuild the portion of its plant which recently was damaged by fire.

GRANVILLE, N. Y.—The Rubberoid Co. contemplates the erection of a factory building.

BROOKLYN, N. Y.—The Nemco Engineer-

(*Concluded on page 422*)

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron..$6.45
Mesabi Bessemer, 55 per cent iron.... 6.20
Old Range nonbessemer, 51½ per cent iron 5.70
Mesabi nonbessemer, 51½ per cent iron 5.55

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent ..... 10.00 to 11.00
Copper free low phosphorus 53 to 65 per cent..... 13.25 to 16.50

FOREIGN IRON ORE
Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent ..... 9.00 to 10.50
Algerian low phosphorus, 52 to 54 per cent ..... 10.00 to 11.00
Swedish and Norwegian low phosphorus, 68 per cent.... nominal
Swedish foundry or basic, 66 to 68 per cent..... 10.50 to 10.75
Spanish foundry or basic, 50 to 54 per cent..... 8.00 to 9.50

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent nominal
Indian, minimum 47 per cent ...(nominal) 40 to 42 cents c.i.f. tidewater
Caucasian, 53 to 55 per cent .....43¾ cents c.i.f. tidewater

Fluor Spar

85 and 5% grade

Washed gravel, Kentucky and Illinois mines, per net ton..$20.00 to $23.50
Washed gravel, imported, duty paid eastern tidewater, per net ton$19.60 to 20.00

Rivets

Structural rivets, Pittsburgh.. 3.00c to 3.25c
Boiler rivets, Pittsburgh .... 3.10c to 3.35c
Rivets, 7/16-in. and smaller..... .....65 and 10 to 65 and 5 off

Nuts and Bolts

NUTS
(Up to 1¼ and 1½ inches inclusive)

Hot pressed square or hexagon blank .....$3.75 off list
Hot pressed square or hexagon tapped ..... 3.75 off list
Cold punched square or hexagon blank ..... 3.75 off list
Cold punched, square or hexagon, ... 3.75 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger.....75 and 5 off
Cold punched semifinished hexagon nuts 9/16-inch and smaller..80 and 5 off
Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
(⅜ x 6 inches, smaller and shorter)

Rolled thread .....50, 10 and 10 off
Cut thread .....50 and 10 off
Larger and longer .....50 and 10 off

MACHINE BOLTS
(⅜ x 4 inches, hot pressed nuts)

Rolled thread .....60 and 10 off
Cut thread .....50, 10 and 10 off
Larger and longer ....50, 10 and 10 off
(⅜ x 4 inches, cold punched nuts)
Cut thread .....45 and 10 off
Larger and longer .....45 and 10 off
Lag screws .....60 off
Plow bolts Nos. 1, 2 and 3 heads..... .....50 and 10 off
4 to 10 heads .....50-10 + 20 off
Stove bolts .....75, 10 and 5 off
Tap bolts .....25 and 10 off
Bolt ends with hot pressed nuts..... .....50, 10 and 10 off
Bolt ends with cold punched nuts.... .....45 and 10 off
Blank bolts .....50, 10 and 10 off
Wrought washers....$5.00 to 5.25c off list
Rough stud bolts with nuts..50 and 10 off

WASHERS
Wrought washers.....$5.00 to $5.25 off

Steel Pipe

(Effective April 19, 1923)
Pittsburgh basing discounts, jobbers' carloads.

	Black	Galvanized
Butt Weld		
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)
Pittsburgh basing discounts, jobbers, carloads

THREADS AND COUPLINGS

	Black	Galvanized
Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
7 to 12-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	..

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap welded)
(Effective April 19, 1923)

2 and 2¼-inch ..... 23 off
2½ and 2¾-inch ..... 33 off
3-inch ..... 36 off
3¼ to 3¾-inch .....38½ off
4 to 13-inch ..... 42 off

CHARCOAL IRON
(Effective April 12, 1923)

1½-inch .....+22
1¾-inch .....+12
2 and 2¼-inch .....+ 2
2½ to 3-inch 3
3¼ to 4½-inch 5

SEAMLESS COLD DRAWN
(Effective April 19, 1923)

1-inch ..... 51 off
1¼ and 1½-inch ..... 43 off
1¾-inch ..... 27 off
2 and 2¼-inch ..... 18 off
2½ and 2¾-inch ..... 28 off
3 and 3¼-inch ..... 32 off
3½ and 3¾-inch ..... 33 off
4-inch ..... 37 off
4½ and 5-inch ..... 29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch ..... 34 off
3½ and 3¾-inch ..... 35 off
4-inch ..... 39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras: ... .
Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.
Add 5 per cent for lengths over 24 feet and not over 26 feet.
Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.
Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts

Carbon, 0.10 to 0.20 per cent .... 83 off
Carbon, 0.30 to 0.40 per cent .... 81 off
Carbon, 0.40 to 0.50 per cent.....net price
Plus differentials and extras for cutting

SEAMLESS STEEL LOCOMOTIVE AND SUPER-HEATER TUBES
(Effective April 19, 1923)

Outside diameter	Gage	Net prices per foot, f.o.b. Pittsburgh Price
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5½-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.

SIVYER S CASTINGS

DEPENDABLE

Axle casting for haul-off on wagon trailer

Simplifying built-up parts with Sivyer Steel Castings

A MANUFACTURER of trucks and trailers formerly built up the haul-off for a wagon trailer with steel straps, bolts and pieces of wood. In this process he used fifty-four pieces of material consisting of twenty-nine bolts, eight steel straps, four iron castings, two U bolts, two strap bolts, two hook bolts, two steel plates and five pieces of wood. To simplify the construction of the part he turned to Sivyer Steel and now uses a total of only eighteen pieces consisting of four Sivyer Castings, ten straight bolts, two rods and two steel straps. The result to him is a considerable reduction of assembly cost and a much stronger and simpler unit. Other manufacturers have made similar gains by replacing built up parts with stronger and less complicated units of Sivyer Electric Steel Castings.

Send Blue Prints

A number of aggressive manufacturers have divided their steel parts into three general classes: those that can be profitably forged; those that cannot be forged economically, or at all, but can be cast in ordinary steel; and those that can be cast most reliably and economically in Sivyer Electric Steel.

The last class includes especially castings with thin and sharply varying sections, and castings that have to be true to pattern, clean and smooth in order to fit the assembly with the minimum of finishing.

With Sivyer Electric Steel we have been able to show certain engineers very decided advantages and economies, not only as against ordinary steel castings and hammered forgings, but also as against malleable castings and fabricated steel.

A certain manufacturer formerly fabricated rocker beams for a crawler chassis by welding two stampings and then pressing in, and welding, sections of steel tubing. The shortcomings, and unnecessary expense of this method were not realized until it was found that the stampings did not have the body required to carry certain desirable attachments. Forgings were impractical. Open hearth practice does not permit the high temperatures necessary for casting thin sections such as those of the design in question. The manufacturer's organization naturally turned to Sivyer Electric Steel. It proved to have all the qualities desired and effected an appreciated reduction in the final cost of the part.

In a number of other cases we have been able to free certain engineers from the handicaps of hammered forgings and in effect give them much greater freedom in design.

We are especially interested in making experimental castings for manufacturers. If you will send us your blue prints for troublesome parts, together with a statement of your difficulties, we will study the problems involved and recommend possible solutions without obligation on your part.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Iron and Steel Production

Compiled By IRON TRADE REVIEW

Pig Iron

	-Stacks- No.	In	—Output— Total	Av. daily
1907				
January	376	311	2,174,801	70,155
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,249,732	
1908				
January	398	139	1,081,813	34,897
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,718,579	
1909				
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,201
October	413	309	2,589,681	83,538
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,325,099	
1910				
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,768
March	417	310	2,588,736	83,508
April	418	291	2,477,700	82,590
May	419	279	2,374,802	76,607
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,791	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,416
Total			26,845,902	
1911				
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,863
April	421	220	2,044,904	68,163
May	421	206	1,871,388	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	
1912				
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	
1913				
January	423	297	2,787,800	89,929
February	423	306	2,578,670	92,095
March	423	278	2,762,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,816,825	90,865
June	422	283	2,616,883	87,229
July	422	264	2,558,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,494,098	83,137
October	425	244	2,539,924	81,933
November	424	225	2,229,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	
1914				
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	
1915				
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,518	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	
1916				
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	
1917				
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	357	3,238,970	104,483
September	431	342	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	
1918				
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,723
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,778
Total			38,437,488	
1919				
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,120
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	
1920				
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,468
September	434	317	3,124,308	104,143
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	
1921				
January	436	184	2,414,753	77,895
February	436	155	1,929,394	68,906
March	436	103	1,594,866	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,642	27,892
August	436	69	954,901	30,802
September	435	84	985,795	32,859
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	
1922				
January	430	127	1,645,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,035,908	65,674
April	429	161	2,070,161	69,005
May	427	175	2,309,348	74,495
June	427	191	2,362,455	78,748
July	427	170	2,403,030	77,517
August	427	143	1,810,665	58,408
September	427	189	2,024,008	67,466
October	428	218	2,629,655	84,827
November	428	241	2,846,110	94,870
December	428	253	3,083,520	99,468
Total			26,850,844	
1923				
January	428	261	3,228,226	104,136
February	424	278	2,993,918	106,925
March	424	295	3,523,595	113,664
April	423	311	3,547,012	118,233
May	423	322	3,868,486	124,790
June	424	323	3,667,868	122,262
July	...	...	.....	.....

Ingots and Castings

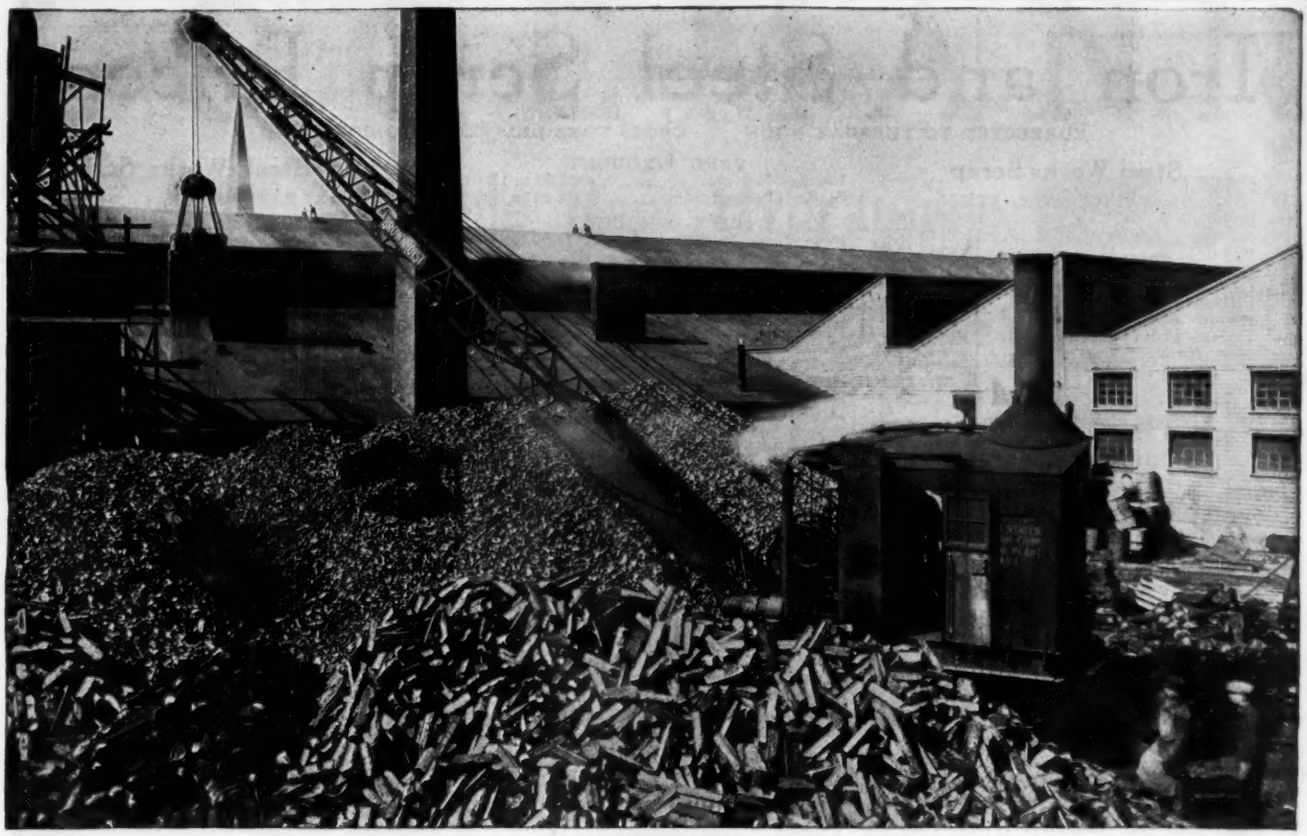
By American Iron and Steel Institute

	Ingots	Castings	Total
1918	43,051,022	1,411,410	44,462,432
1919	33,694,795	976,437	34,671,232
1920	40,881,392	1,251,542	42,132,934
1921	19,184,084	559,713	19,743,797
1922	34,568,418	1,034,508	35,602,926

Monthly Ingot Output

Gross Tons

1922	84.15 per cent of capacity	Calculated total
January	1,593,482	1,891,857
February	1,745,022	2,071,772
March	2,370,751	2,814,667
April	2,444,513	2,902,240
May	2,711,141	3,218,794
June	2,634,477	3,127,775
July	2,487,104	2,952,806
August	2,214,582	2,629,256
September	2,373,779	2,818,261
October	2,872,415	3,410,265
November	2,889,297	3,430,309
December	2,779,890	3,300,416
Total	29,116,453	34,568,418
1923	**95.35 per cent**	
January	3,644,629	3,822,369
February	3,294,264	3,454,918
March	3,858,675	4,046,854
April	3,760,997	3,944,412
May	4,000,695	4,195,800
June	3,574,567	3,748,890



Saving Labor is Always Worth While

Labor must always be used wisely to get the best production results. And it is a shame to waste labor by having a gang of 30 or 40 men doing work which one man could do if properly equipped.

The saving effected by a Brownhoist Locomotive Crane on a job of handling coal and other bulk materials is very great. Getting the results you expect from 30 or 40 laborers at the price you would pay 3 or 4 is a saving worth while. That is the result many Brownhoist users are getting.

Brownhoist cranes are used for a lot of different jobs around the plant or yard. A shift from bucket to bottom block or magnet is made in a short time. And with the crane's ability to handle almost every kind of material is coupled the flexibility of traveling anywhere on tracks and switching cars.

If you have much material to handle let us tell you at what cost a Brownhoist will do the work. Catalog K shows many of these cranes on jobs that will interest you. Shall we send you a copy?

Brownhoist Products

Locomotive Cranes
Concrete Bunkers
Dock Machinery
Chain Conveyors
Belt Conveyors
Bridge Cranes
Buckets, etc.

Literature on request

The Brown Hoisting Machinery Co., *Cleveland, O.*

Branches: New York, Chicago, Pittsburgh, San Francisco, New Orleans

BROWNHOIST

MATERIAL HANDLING MACHINERY

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	15.00 to 16.00
Boston (dealers)	11.50 to 12.00
Buffalo	17.00 to 18.00
Chicago	16.50 to 16.75
Cleveland	15.50 to 16.00
Cincinnati	14.00 to 14.50
Detroit (dealers)	13.50 to 14.00
Eastern Pennsylvania	15.50 to 16.50
New York (dealers)	12.00 to 12.50
Pittsburgh (dealers)	16.50 to 17.00
St. Louis	16.00 to 16.50
Valleys (nominal)	18.00
No. 1 railroad steel New York (dealers)	12.50 to 13.00

BUNDLED SHEETS

Buffalo	$15.00 to 15.50
Cleveland	9.50 to 10.00
Cincinnati	11.50 to 12.00
Detroit	9.00 to 9.50
Eastern Pennsylvania	13.50 to 14.00
Pittsburgh	14.50 to 15.00
St. Louis	8.00 to 8.50
Valleys	14.00 to 14.25

STEEL RAILS, SHORT

Birmingham	17.00 to 17.50
Boston (dealers)	11.50 to 12.00
Chicago	19.50 to 20.00
Cincinnati	20.00 to 20.50
Cleveland	15.00 to 15.50
St. Louis	17.50 to 18.00

STOVE PLATE

Birmingham	16.00 to 17.00
Boston	17.00 to 18.00
Buffalo	17.00 to 17.50
Chicago	16.50 to 17.00
Cincinnati (net tons)	9.50 to 10.00
Cleveland	12.50 to 12.75
Detroit (net ton) (dealers)	12.50 to 13.50
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	12.50 to 13.00
Pittsburgh	15.00 to 15.50
St. Louis	15.00 to 15.50

LOW PHOSPHORUS

Buffalo	23.50 to 24.50
Cincinnati	15.00 to 15.50
Eastern Pennsylvania	22.50 to 23.00
Pitts. billets and bloom crops	22.50 to 23.00

SHOVELING STEEL

Chicago	16.50 to 17.00
Pittsburgh	13.50 to 14.00
St. Louis	16.00 to 16.50

KNUCKLES, COUPLERS & SPRINGS

Chicago	21.00 to 21.50
Eastern Pennsylvania	20.00 to 21.00
Pittsburgh	20.50 to 21.00
St. Louis	20.50 to 21.00

COMPRESSED SHEETS

Buffalo	15.00 to 16.00
Chicago	13.50 to 14.00
Cleveland	12.75 to 13.25
Detroit (dealers)	11.50 to 12.00
Pittsburgh	15.50 to 16.00
Valleys	16.75 to 17.00

FROGS, SWITCHES, GUARDS

Chicago	17.00 to 17.50
Eastern Pennsylvania	15.50 to 16.50
St. Louis	16.50 to 17.00

BOILER PLATE, CUT

St. Louis	11.50 to 12.00

ANGLE BARS—STEEL

Chicago	17.75 to 18.25
St. Louis	17.00 to 17.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	14.50 to 15.00
Boston (dealers)	14.00 to 14.50
Buffalo	15.00 to 16.00
Chicago, No. 1	16.25 to 16.75
Chicago, No. 2	17.00 to 17.50
Cincinnati No. 1	13.00 to 13.50
Eastern Pennsylvania	17.50 to 18.50
Pittsburgh, No. 1	16.00 to 16.50
Pittsburgh, No. 2	16.50 to 17.00
New York, No. 1 (dealers)	15.50 to 16.50
St. Louis, No. 1	16.25 to 16.75
St. Louis, No. 2	16.50 to 17.00

WROUGHT PIPE

Boston (dealers)	9.50 to 10.00
Buffalo	14.00 to 15.00
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	9.50 to 10.00

YARD WROUGHT

Boston	12.00 to 12.50
Eastern Pennsylvania	16.50 to 17.50

CITY WROUGHT

New York, long	14.00 to 14.50

BUSHELING

Buffalo, No. 1	15.50 to 16.00
Chicago, No. 1	14.50 to 15.00
Chicago, No. 2	12.00 to 12.50
Cincinnati No. 1	10.50 to 11.00
Cleveland, No. 1	10.00 to 10.25
Cleveland, No. 2	8.00 to 9.00
Detroit, No. 1	11.50 to 12.00
Detroit, No. 2 (new)	10.00 to 10.50
Detroit, No. 2 (old)	8.00 to 8.50
Eastern Pennsylvania	16.00 to 17.00
Pittsburgh, No. 1	15.00 to 15.50
St. Louis No. 1	15.00 to 15.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 10.00
Boston (dealers)	9.00 to 9.50
Buffalo	8.00 to 9.00
Chicago	9.75 to 10.00
Cleveland	9.50 to 10.00
Cincinnati (net tons)	8.50 to 9.00
Detroit (dealers)	7.00 to 7.50
Eastern Pennsylvania	13.50 to 14.00
New York (dealers)	10.00 to 10.50
Pittsburgh	10.50 to 11.00
St. Louis	8.00 to 8.50
Valleys	11.00 to 11.25

CAST IRON BORINGS

Birmingham (chemical)	16.50 to 17.00
Birmingham (plain)	10.00 to 11.00
Boston (chemical)	12.50 to 13.00
Boston (dealers)	10.00 to 10.50
Buffalo	14.00 to 14.50
Pittsburgh	14.50 to 15.00
Chicago	12.50 to 13.00
Cincinnati (net tons)	9.00 to 9.50
Cleveland	11.50 to 11.75
Detroit (dealers)	10.00 to 10.50
Eastern Pennsylvania	14.50 to 15.50
Eastern Pennsylvania (chem.)	17.00 to 19.00
New York (dealers' price)	10.50 to 11.00
Pittsburgh	14.00 to 14.50
St. Louis	13.50 to 14.00
Valleys	14.00 to 14.25

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	8.00 to 8.50
Cleveland	10.25 to 10.75
Detroit (dealers)	9.50 to 10.00
Eastern Pennsylvania	12.50 to 13.50
New York (dealers)	9.50 to 10.00

IRON AXLES

Birmingham	24.00 to 25.00
Boston (consumers)	31.00 to 32.00
Buffalo	28.00
Chicago	27.00 to 27.50
Cincinnati	22.00 to 22.50
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	27.00 to 28.00
St. Louis	27.00 to 27.50

IRON RAILS

Buffalo	20.00 to 21.00
Chicago	21.50 to 22.00
Cincinnati	13.00 to 13.50
St. Louis	16.00 to 16.50

PIPES AND FLUES

Chicago	12.50 to 13.00
Cincinnati	9.50 to 10.00
Cleveland	8.00 to 9.00
St. Louis	12.00 to 12.50

RAILROAD GRATE BARS

Buffalo	17.00 to 17.50
Chicago	14.50 to 15.00
Cleveland	12.50 to 12.75
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	13.00 to 13.50
St. Louis	14.50 to 15.00

FORGE FLASHINGS

Boston (dealers)	10.50 to 11.00
Chicago, small	12.50 to 13.00
Cleveland, small	10.25 to 10.75
Cleveland, large	10.00 to 10.50
Detroit (dealers)	10.00 to 10.50

FORGE SCRAP

Boston (dealers)	10.50 to 11.00
Chicago	17.00 to 17.50
Eastern Pennsylvania	14.00 to 14.50

ARCH BARS AND TRANSOMS

Chicago	26.00 to 26.50
St. Louis	22.50 to 23.00

ANGLE BARS—IRON

Chicago	26.00 to 26.50
St. Louis	24.00 to 24.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	11.00 to 11.50
Buffalo	17.00 to 18.00
Chicago	14.50 to 15.00
Cleveland	13.75 to 14.00
Eastern Pennsylvania	14.00 to 15.00
Pittsburgh	14.50 to 15.00
St. Louis	13.50 to 14.00

STEEL CAR AXLES

Birmingham	20.00 to 21.00
Boston (consumers)	22.00 to 23.00
Buffalo	24.50 to 25.50
Chicago	19.00 to 20.00
Cleveland	20.00 to 20.50
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	nominal
Pittsburgh	19.00 to 20.00
St. Louis	21.00 to 21.50

SHAFTING

Boston (consumres)	22.00 to 23.00
Chicago	23.50 to 24.00
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	18.50 to 19.00
St. Louis	22.50 to 23.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	18.50 to 19.00
Birmingham, iron	18.00 to 18.50
Boston (consumers)	22.00 to 23.00
Buffalo, iron	16.50 to 17.50
Chicago, iron	19.50 to 20.00
Cincinnati	14.50 to 15.00
Eastern Pennsylvania	20.00 to 21.00
New York iron (dealers)	17.00 to 18.00
Pittsburgh, iron	18.00 to 18.50
Pittsburgh, steel	19.50 to 20.00
St. Louis, iron	18.50 to 19.00

NO. 1 CAST SCRAP

Birmingham, cupola	19.50 to 20.00
Boston (consumers)	22.50 to 23.00
Buffalo	19.50 to 20.50
Chicago, cupola	22.00 to 22.50
Cincinnati No. 1 machinery cupola (net tons)	19.50 to 20.00
Cleveland, cupola	18.50 to 19.00
Detroit (net ton) (dealers)	16.00 to 16.50
Eastern Pennsylvania, cupola	20.00 to 21.00
New York, cupola (dealers)	17.00 to 18.00
Pittsburgh, cupola	20.50 to 21.00
San Francisco	26.00 to 28.00
St. Louis, railroad	20.00 to 20.50
St. Louis, agricultural	20.00 to 20.50
Valleys	20.00 to 20.50

HEAVY CAST

Boston (consumers)	20.00 to 21.00
Buffalo	16.00 to 17.00
Cleveland	13.00 to 13.25
Detroit (automobile) net ton)	19.00 to 20.00
Eastern Pennsylvania	18.50 to 19.50
New York (dealers)	16.00 to 16.50
Pittsburgh	17.00 to 17.50

MALLEABLE

Boston (railroad) (consumers)	22.00 to 23.00
Buffalo	20.00 to 21.00
Chicago, railroad	22.00 to 22.50
Chicago, agricultural	20.00 to 21.00
Cincinnati, agricultural	16.00 to 16.50
Cincinnati, railroad	16.50 to 17.00
Cleveland, agricultural	19.00 to 19.50
Cleveland, railroad	20.00 to 21.00
Detroit (dealers)	19.00 to 20.00
Eastern Pennsylvania, railroad	17.00 to 17.50
Pittsburgh, railroad	19.50 to 20.00
St. Louis, agricultural	19.00 to 19.50
St. Louis, railroad	19.00 to 19.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	16.00 to 17.00
Boston (dealers)	14.00 to 14.50
Chicago	17.75 to 18.00
Cleveland	18.00 to 18.50
Detroit	13.50 to 14.00
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	17.50 to 18.50
Pittsburgh district	18.00 to 18.50
St. Louis	17.00 to 17.50

LOCOMOTIVE TIRES

Chicago	17.00 to 18.00
St. Louis	17.00 to 17.50

LOW PHOSPHORUS PUNCHINGS

Chicago	19.00 to 19.50
Eastern Pennsylvania	22.50 to 23.00
Pittsburgh	21.00 to 21.50

LOGEMANN

Double Ram Hydraulic

Scrap-Metal Presses

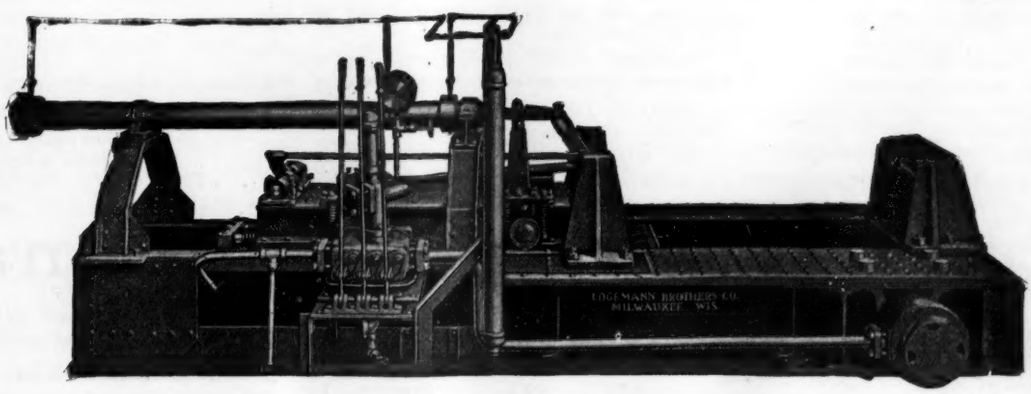
STANDARD

In Hundreds of Mills, Yards and Plants

Hydraulic-compressed scrap always commands the best prices. It is more conveniently stored—more economically handled—there is less loss from corrosion—less heat is required for remelting.

Loose Scrap is worth almost nothing.
Compare this with prices paid for "hydraulic-compressed."

LOGEMANN BROTHERS CO., 3126 Burleigh St. MILWAUKEE, WIS.



We build Balers for All Purposes

Hand-balers for waste-paper, power and hydraulic balers for the textile trades, hydraulic presses for metal and waste trades

Also Hydraulic Shaft Straighteners, Etc.

East of the Mississippi

(*Concluded from Page* 416)

ing & Mfg. Co., 24 Vanderbilt avenue, has leased a plant building in Long Island City, which it will utilize for its own use.

BUFFALO—H. W. Wolcott, 1461 Main street, plans the erection of an addition to his plant, which it devoted to the manufacturing of batteries.

FT. MILLER, N. Y.—The Fort Miller Pulp & Paper Corp. plans the erection of a 1-story addition to its plant, 45 x 125 feet, to be built at an estimated cost of $200,000.

LONG ISLAND CITY, N. Y.—The Boyce Motometer Co. contemplates the erection of a factory building.

NEW YORK—Johns-Manville, Inc., Madison avenue and Forty-sixth street, plans the erection of a 1-story plant building, 150 x 1000 feet, at Asbestos, Que.

NEW YORK—The American Can Co., 120 Broadway, has let a contract to the Lindgren Co. for the erection of a 2-story addition to its San Francisco plant to be built at an estimated cost of $300,000.

ROCHESTER, N. Y.—The Asbestos Corp., 964 Chili avenue, plans the erection of a 2-story factory building, 70 x 100 feet, to be built at an estimated cost of $35,000.

ROCHESTER, N. Y.—The Rochester Body Co., Inc., Favor street, plans the erection of a 2-story addition to its plant, 60 x 225 feet, to be built at an estimated cost of $40,000. W. F. Hunt is one of the officers of the company.

BURLINGTON, N. C.—The Midway Foundry Co. plans to rebuild the part of its plant which recently was damaged by fire.

CINCINNATI.—The Ohio Valley Power & Light Co. has been incorporated with $10,000 capital stock by Walter A. Todd, William F. Landwehr, Elmer E. Butterfield, Guy L. Ireland and Charles A. Reid.

CINCINNATI.—The Diamond Paint Cleaner Co. recently was incorporated with a capital stock of $100,000 by Don C. Smith, Harry Rosenbaum, Harriet C. Gang, Charles W. Potter and Emil N. Schlesinger.

CLEVELAND—The Globe Brass Mfg. Co., 5532 Perkins avenue, plans the erection of a new plant building, which includes a machine shop and foundry.

MASSILLON, O.—The Central Furnace Co. recently was incorporated by R. E. Rebb, F. J. Griffiths and others.

SABINA, O.—The Vaco Washer Co. has been incorporated with a capital stock of $10,000 to manufacture electric washing machines, by R. W. Allen and others.

SPRINGFIELD, O.—The Bauer-Stuart Co. has been incorporated with $25,000 capital stock to engage in the manufacture of automobile shock absorbers, etc., by Louis E. Bauer, Harve R. Stuart and others.

YOUNGSTOWN, O.—The Peeble's Mfg. Co., Newton Falls, O., has let a contract for the erection of two buildings, 50 x 180 feet and 100 x 100 feet.

BELLEFONTE, PA.—Decker Bros., North Spring street, plans the erection of a 1-story machine shop, 90 x 120 feet.

BETHLEHEM, PA.—The Superior Metal Co. has been incorporated with $40,000 capital stock to manufacture metal products. It now is erecting a plant the first unit of which will cost about $25,000. Henry M. Kelly, Ottawa, Ill., is treasurer of the company.

LOCK HAVEN, PA.—A plant will be erected by Harold M. Fredericks, now operating an electrical equipment and repair plant.

Machine Tool Exports

The total valuation of lathes and other metal working machinery exported from the United States during May was $141,414, *according to a recent report of the United States department of commerce, bureau of foreign and domestic commerce. The valuation of tools exported by countries is as follows:*

Countries	Lathes dollars	Boring and drilling machinery dollars	Planers, shapers and slotters dollars	Milling machinery dollars
Belgium	....	2,520	....	494
France	....	1,161	....	....
Germany	1,155	....	....	1,450
Netherlands	....	1,000	....	....
Poland and Danzig	5,581	....	....	....
Spain	....	114	....	....
Sweden	....	....	....	650
England	6,273	4,215	....	5,933
Canada — Maritime Prov.	157	....	....	....
Quebec and Ontario	5,986	21,165	5,534	4,400
Brit. Col. and Yukon	247	....	....	....
Guatemala	763	....	....	....
Mexico	4,881	272	3,275	2,900
Trinidad and Tobago	154	....	....	....
Cuba	629	3,789	288	....
Argentina	....	2,252	....	....
Bolivia	1,165	....	....	....
Brazil	....	773	....	....
Colombia	1,845	....	....	....
British India	947	1,000	....	....
China	....	100	....	....
Japan	25,761	3,745	8,159	....
Australia	618	....	....	9,087
New Zealand	300	....	....	....
British East Africa	676	....	....	....
Total	57,138	42,106	17,256	24,914

West of the Mississippi River

LOS ANGELES—The Pacific Steel Corp., recently organized, has purchased a site of 2000 acres at Long Beach, Cal., for a plant. D. M. Reynolds is president of the company.

LOS ANGELES—The McGuire Cabinet Co., 1514 Hooper avenue, has awarded a contract to W. F. Gow, Bank of Italy building, for the erection of a 2-story addition to its plant, to be built at an estimated cost of $25,000.

LOS ANGELES—The California Spring Co. will take bids soon for the erection of a 1-story plant building, 107 x 120 feet, to be built at an estimated cost of $23,000. W. Douglas Lee, Sun building, is architect.

SANTA ANNA, CAL.—The Pacific Wheel & Rim Co., 417 North Broadway, plans the erection of a plant here for the manufacture of disk wheels and rims.

DAVENPORT, IOWA—The Frank Foundry Co. has obtained a permit to erect an addition to its plant at an estimated cost of $10,000.

GUTTENBURG, IOWA—The Climax Mfg. & Foundry Co. has been incorporated with $50,000 capital stock by M. Gilbert, Emil Ihm, M. C. Mintzlaff and J. P. Eckart.

HAMPTON, IOWA—The Hampton Brick & Tile Co. plans the erection of a 1-story plant to be built at an estimated cost of $80,000.

KANSAS CITY, MO.—The Kansas City Power & Light Co., 1330 Grand avenue, plans the erection of a 2-story plant building, 160 x 180 feet, to be built at an estimated cost of $125,000. A. E. Bettes is chief engineer.

ST. LOUIS—The Congo Grease Machine Corp. plans to establish a plant for the manufacture of grease machines. The company recently was organized with $50,000 capital stock by H. A. Robert Fisher and A. M. McSpadden.

SHELBY, MONT.—The Campbell Oil Co. plans the erection of an oil refinery here.

DALLAS, TEX.—Sutton, Steele & Steele are erecting a $175,000 steel foundry.

FT. WORTH, TEX.—The Bucy-Ingram Lumber Co. plans the construction of a power house, 110 x 265 feet.

PORT ARTHUR, TEX.—The Eastern Texas Electric Co. plans extensions to its power plant to be built at an estimated cost of $135,000.

SAN JUAN, TEX.—The Orchard Fire Pot Foundry Co., Banks L. Miller, manager, plans the erection of a plant building, 36x70 feet.

SEATTLE—Samuel Gustav of the Pacific Junk Co. has purchased a site for a plant.

Business in Canada

LETHBRIDGE, ALTA.—The Dominion Refineries, Ltd., has started work on the erection of a plant.

BRAMPTON, ONT.—The Brampton Tire & Rubber Co., Ltd., has been incorporated to manufacture rubber goods, etc., with $250,000 capital stock by Roy L. Kellock, Edward C. Jordan and Marion L. McElwain.

HAMILTON, ONT.—The Delta Electric Co., Ltd., has been incorporated to manufacture electrical supplies and equipment with $40,000 capital stock by James L. Schiller, Harry Short and Gordon L. Sherk.

STRATFORD, ONT.—The Goderich Mfg. Co., Goderich, Ont., J. E. Baechler, president, is looking for a site here, where it plans to erect a manufacturing plant.

TORONTO, ONT.—The plant of the Toronto Foundry Co., 1884 Davenport road, recently was damaged by fire.

TORONTO, ONT.—Woods Steamer, Ltd., has been incorporated to manufacture automobiles, etc., with $2,500,000 capital stock by Oliver F. Woods, George J. Woods, Clara L. Morton and others.

TORONTO, ONT.—The Autoquip, Ltd., has been incorporated to manufacture automobile equipment with $50,000 capital stock by William T. Stewart, Robert W. McClintock, Arthur W. Roebuck and others.

MONTREAL, QUE.—Cid Electric Heater Co., Ltd., has been incorporated to manufacture electrical machinery, tools, transformers, appliances, etc., with $300,000 capital stock; by Francis J. Laverty, Shirley G. Dixon, Arthur I. Smith and others.